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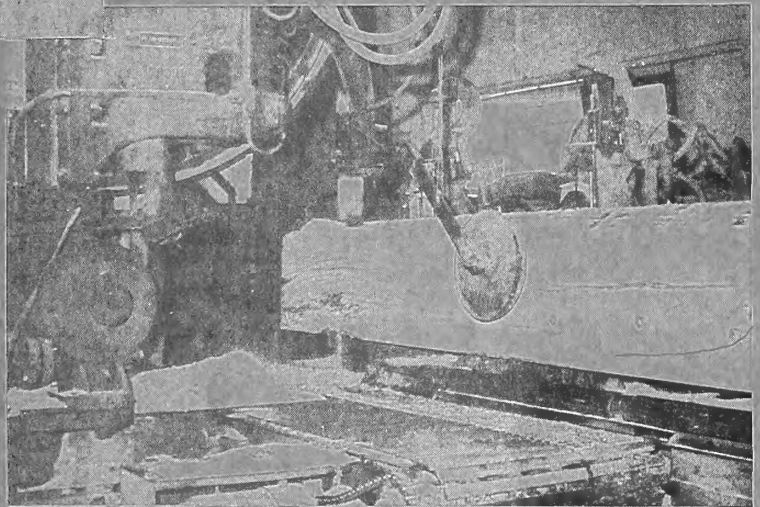
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LUMBER RECOVERY FROM

RED AND WHITE FIR

IN

CENTRAL CALIFORNIA



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T. D. FAHEY

PROCUREMENT SECTION
CURRENT SERIAL RECORDS

APR 74

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ABSTRACT

Lumber recovery data from processing 1,126 logs from 234 red and white fir trees selected from the central Sierra Nevada of California are presented. More than 88 percent of the lumber recovered was in two major groups of lumber items--Shop (29 percent) and Dimension (59 percent); the remainder consisted of Damage (8 percent), Selects (2 percent), and Commons (2 percent).

Recovery of Shop was highest from grade 1 logs; Dimension, from grade 3 logs. Larger logs produced proportionately greater volume of Shop and Select; smaller logs, Dimension.

Cubic recovery of surfaced-dry lumber ranged from 42 percent in grade 1 logs to 52 percent in grade 4 logs. For all logs, a cubic recovery of 48 percent was recorded.

Overrun for the 1,126 logs was 22 percent. Grade 1 logs gave the lowest overrun, 15 percent, and grade 3 logs the highest, 29 percent. Average log size and the range of log sizes within a given log grade were important determinants of overrun.

The recovery of sawdust and chippable residues and distribution of lumber sizes produced are included in the report.

Keywords: Lumber recovery, red fir, *Abies magnifica*, white fir, *Abies concolor*, forest products.

INTRODUCTION

The true firs (*Abies* sp.) represent approximately 13 percent of the commercial sawtimber volume in the Western United States. This amounts to nearly 235 billion board feet. The true firs approximate 25 percent of California's softwood sawtimber volume. In the central Sierra Nevada of California, California red fir (*A. magnifica* A. Murr.) and white fir (*A. concolor* (Gord. & Glend.) Lindl.) have a volume of 13.5 billion board feet. This volume is approximately 50 percent of the commercial softwood resource of that area.

Red and white fir, called "white fir" commercially, have become progressively more important as a source of raw material for the wood-using industry. In 1960, approximately 380 million board feet, log scale, of red and white fir were produced from National Forest lands in California; these same forest lands produced over 620 million feet in 1970. In 1970 over 1.7 billion board feet of commercial white fir lumber was produced in the Western United States; of this amount nearly half was from California.

With expanded utilization of the true firs, a need has developed for up-to-date information on grade and volume recovery of lumber from these species. Furthermore, recent changes in utilization standards, manufacturing, and marketing require up-to-date data on grade and volume recovery. With updated information, it is possible for plant managers and processors to utilize the true firs more efficiently.

To provide this information, a lumber and a veneer recovery study were carried out in 1970 in cooperation with the National Forest Administration; U.S. Forest Service, Region 5; and the

American Forest Products Corporation, Martell, California. This is a report of the lumber recovery study. The veneer recovery study will be in another report.

PROCEDURE

SAMPLE SELECTION

A total of 234 trees, both California red fir and white fir, representative of the full range of size and quality of true fir timber in the central Sierra Nevada, were selected from 18 areas located on the Tahoe, Eldorado, and Stanislaus National Forests (fig. 1). Stands from which the trees were selected were considered typical of the timber in that general locale. Individual study trees were stratified on the basis of tree size (diameter at 4-1/2 feet above ground level on the uphill side), butt log grade,^{1/} and defect location (c).

Prior to felling, surface characteristics for the first 32 feet were diagrammed (2,5), and other important details of each tree and surrounding area were noted and recorded. Each tree was numbered, then felled and bucked into lengths according to industry practice. Maximum log length was 32 feet plus trim.

While the tree was on the ground and before it was disturbed, surface characteristics on the visible log surface were diagrammed. All logs were tagged and numbered for tree identity and log location in the main stem. Utilization standards during logging were 10-foot length, 8-inch scaling diameter,^{2/} and one-third sound. Cull logs and logs not meeting minimum size requirements were

^{1/} Based on Region 6 west-side Douglas-fir grades without diameter limits.

^{2/} The average diameter, inside bark, rounded to the nearest inch at the small end of the log.

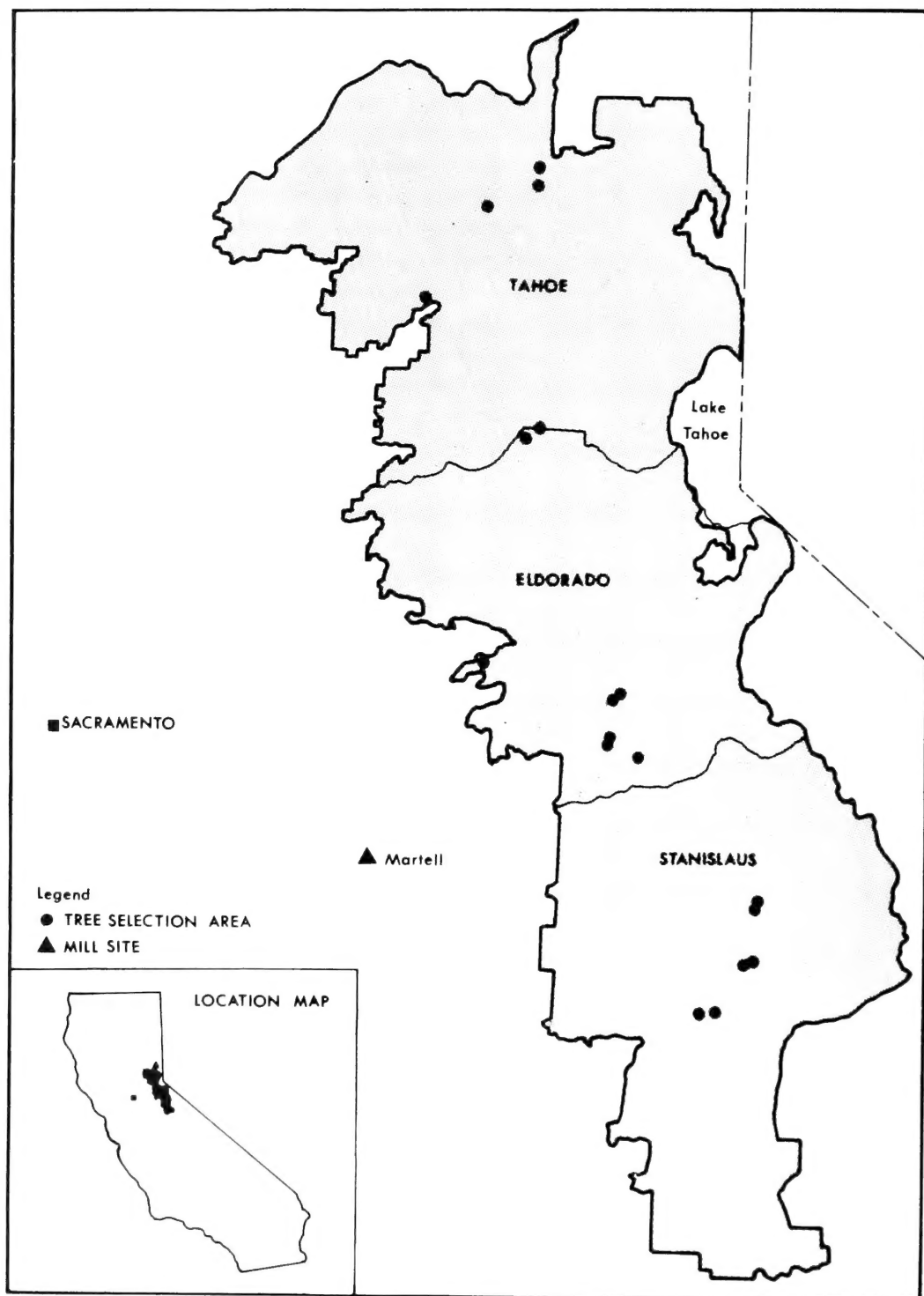


Figure 1.--Approximate location of study tree selection areas in the central Sierra Nevada, and mill location.

left in the woods. Logs were decked and kept under water spray at the mill until the study began.

LOG GRADING AND SCALING

During the study, each woods-length log was debarked and bucked into sawmill-length logs. These were then scaled (7) and tagged to identify the tree and the log's position within the tree. Grades for these logs were determined from log diagrams using U.S. Forest Service grades for white fir (9) (table 1). There were 1,126 mill-length logs in the study, ranging in diameter from 7 to 50 inches and in length from 6 to 20 feet (table 2).

SAWING

Each log was sawed to meet scheduled mill production through the manufacture of usual lumber items. Sawing practices during the study period conformed to general industry practice on the west-side Sierra and were geared to produce Select, Shop, Common, and Dimension lumber. All lumber was sawed to meet Western Wood Products Association (WWPA) specifications (8).

Production equipment in the study mill included two band head saws--one double cut and one single cut; two edgers; one line bar resaw; and one gang trim saw. Green lumber was sorted for further processing with a 24-tray automatic sorter. Maximum length of log sawn was 20 feet.

LUMBER PROCESSING

At the time of sawing, logs were assigned a sawing order number cross-referenced to the tree log number. Boards from each log were identified by a combination of color coding and marking each board with the log's sawing

order number. There was no "green grading" of the lumber prior to tray sorting. All rough-green lumber was sorted by width, thickness, length, and drying sort--either sinker, sap, or corky. Each sort was dried in a separate charge with a different kiln schedule. All lumber except Dunnage and 4/4 Common was kiln-dried in modern, single track, internal fan, cross-circulation kilns. Dunnage was tallied "green" as it was removed from the trays. Common grades of lumber were graded and tallied "green." The kiln-dried lumber was sorted for surfacing, graded, and tallied on the dry sort table. Both a hand and a photographic tally (4) were made of the rough-dry lumber. A WWPA Quality Supervisor graded the lumber.

All dried lumber was surfaced except Moulding, which was tallied in the rough-dry condition. Dimension grades of lumber were surfaced four sides through a planer equipped with splitter heads; all Selects and Shops were surfaced two sides. During the surfacing, a hand and voice tally (on magnetic tape) and a photographic tally were made of each board on the infeed of the planer; a hand and photographic tally were made on the outfeed. Grading of the surfaced lumber was supervised by WWPA Quality Supervisors.

Tallied data for each rough and surfaced board included length, width, thickness, grade, and log sawing number.

*Table 1.—Distribution of white and red fir logs
by diameter and log grade*

Diameter (inches)	Log grade ^{1/}				Total
	No. 1	No. 2	No. 3	No. 4	
----- <i>Number</i> -----					
7	0	0	6	0	6
8	0	1	55	0	56
9	0	4	46	3	53
10	0	6	53	10	69
11	2	6	54	2	64
12	2	6	43	9	60
13	0	6	35	8	49
14	0	10	30	8	48
15	3	8	33	6	50
16	5	10	23	22	60
17	3	8	22	15	48
18	3	7	14	11	35
19	4	7	17	17	45
20	1	8	15	15	39
21	5	9	9	12	35
22	5	7	8	12	32
23	4	9	10	11	34
24	4	6	3	12	25
25	5	9	6	12	32
26	5	1	5	12	23
27	2	5	3	17	27
28	2	3	4	7	16
29	2	9	4	17	32
30	3	4	1	16	24
31	3	6	2	6	17
32	5	5	3	9	22
33	4	5	0	6	15
34	0	4	2	10	16
35	4	4	0	9	17
36	1	2	0	7	10
37	3	4	0	6	13
38	3	3	0	3	9
39	3	1	1	7	12
40	2	2	0	2	6
41	1	1	0	5	7
42	0	2	0	2	4
43	0	0	1	0	1
44	4	2	0	2	8
45	0	0	0	1	1
46	0	0	1	1	2
47	0	0	0	0	0
48	0	1	0	0	1
49	1	1	0	0	2
50	1	0	0	0	1
Total	95	192	509	330	1,126

^{1/} Wise and May (9).

Table 2.—Distribution of white and red fir study saw logs by diameter and length

Diameter (inches)	Log length (feet)								Total
	6	8	10	12	14	16	18	20	
----- Number -----									
7	0	0	3	0	0	1	2	0	6
8	0	0	9	16	9	12	8	2	56
9	0	1	12	10	6	14	7	3	53
10	0	1	9	12	5	29	9	4	69
11	0	0	7	9	5	33	9	1	64
12	0	0	4	10	0	37	7	2	60
13	0	1	6	9	0	31	2	0	49
14	0	1	5	2	4	32	4	0	48
15	0	1	2	6	2	33	5	1	50
16	0	0	2	11	1	39	5	2	60
17	1	0	2	10	0	30	4	1	48
18	0	0	1	4	2	26	1	1	35
19	0	1	5	5	0	28	5	1	45
20	0	0	2	4	2	26	4	1	39
21	0	0	2	1	1	27	4	0	35
22	0	0	1	2	1	26	2	0	32
23	0	0	0	3	1	30	0	0	34
24	0	0	1	0	1	20	2	1	25
25	0	0	2	2	0	24	3	1	32
26	0	0	3	2	0	18	0	0	23
27	0	0	2	0	1	19	4	1	27
28	0	0	0	1	0	15	0	0	16
29	0	0	0	1	1	27	2	1	32
30	0	0	1	2	1	19	1	0	24
31	0	0	0	1	0	15	1	0	17
32	0	0	2	1	0	17	2	0	22
33	0	0	0	1	0	14	0	0	15
34	0	0	0	1	0	15	0	0	16
35	0	0	0	0	0	16	0	1	17
36	0	0	0	0	0	8	1	1	10
37	0	0	0	0	0	12	1	0	13
38	0	0	0	0	0	9	0	0	9
39	0	0	0	0	0	12	0	0	12
40	0	0	0	0	0	6	0	0	6
41	0	0	0	0	0	6	1	0	7
42	0	0	0	1	0	3	0	0	4
43	0	0	0	0	0	1	0	0	1
44	0	0	0	1	0	7	0	0	8
45	0	0	0	0	0	1	0	0	1
46	0	0	0	0	0	2	0	0	2
47	0	0	0	0	0	0	0	0	0
48	0	0	1	0	0	0	0	0	1
49	0	0	0	1	0	1	0	0	2
50	0	0	0	0	0	1	0	0	1
Total	1	6	84	129	43	742	96	25	1,126

DATA PROCESSING

The hand tallied, rough-dry board data were edited and corrected using the photographic tally made on the dry sort table. Data for the rough-dry Moulding and the Commons (which were not dried) were then separated from these corrected tallies and later merged with the tally of data for surfaced-dry lumber. Dunnage data tallied at the tray sorter were also merged with the surfaced-dry tally.

The hand tallied, surfaced-dry board data were edited and corrected using the photographic tally made at the outfeed side of the planer. The hand tally of sawing order numbers made at the infeed of the planer was edited and corrected using both the voice and photographic tally. The corrected infeed and outfeed tallies were then matched and merged.

All data were transferred from tally sheets to punchcards. These were processed, using computer programs written specifically for handling recovery data (1) and computer programs developed by the Pacific Northwest Station's biometric staff.

Tabulated volumes of board-foot lumber tally given in this paper were based on nominal dimensions of the lumber produced; cubic volume was computed using actual surfaced-dry lumber sizes.

Gross cubic log volumes were computed using the formula:

$$V = \frac{\pi L (D_s^2 + D_s D_e + D_e^2)}{4 \times 3 \times 144}$$

where:

V = Gross cubic-foot log volume

π = 3.1416

D_s = Diameter in inches of small end of log

D_e = Diameter in inches of large end of log

L = Log length in feet.

Volume of wood converted to sawdust was calculated by applying an average sawkerf of 8/32-inch to one-half the rough green surface area of each board produced. Green lumber dimensions used in this computation were based on sample measurements of actual green study lumber.

Residue volumes were determined by subtracting the volumes of rough green lumber and sawdust from the gross cubic volumes of the logs.

RESULTS

LOG SCALE, LUMBER TALLY, AND CUBIC VOLUMES

Table 3 summarizes the log scale; surfaced-dry lumber tally; and cubic volume of the logs included in the study for each log grade group and for all grades. Tables 10-14 in the appendix give a more detailed breakdown of these data by log scaling diameter.

Table 3 shows that logs in the two higher grades are more defective than in the two lower grades. Grades 1 and 2 had, respectively, 14- and 13-percent defect compared with grades 3 and 4, which averaged 4- and 9-percent defect, respectively. The defect for all logs was 10 percent. In each log grade, the larger diameter logs were the more defective (fig. 2). Grades 1 and 2 were about equally defective. Grade 4 logs, though less defective than either grades 1 or 2, were more defective than grade 3 logs.

Higher values of overrun (percent lumber tally recovery) (table 3) for grade 3 logs reflect in part the preponderance of small logs in this grade (table 1, fig. 3). In grades 1, 2, and 4 logs, a wider distribution of log sizes resulted in lower overruns (table 1, figs. 3 and 4). The average diameter of the grade 3 logs was 14.1 inches; grades 1 and 2, 27.2 and

Table 3.—Log scale, lumber tally, and cubic volumes of mill-length white and red fir logs, by grade of log

Log 1/ grade	Number of logs	Log scale 2/		Defect amount	Lumber tally		Cubic volume 3/			
		Gross	Net		Volume	Recovery 4/	Log	Lumber 5/	Lumber recovery 6/	Residue
		-- Board feet --		Percent	Board feet	Percent	-- Cubic feet --	Percent	-- Cubic feet --	--
1	95	56,440	48,670	14	56,105	115	8,666	3,679	42	902
2	192	80,980	70,660	13	85,688	121	11,717	5,421	46	1,329
3	509	73,930	70,740	4	91,007	129	11,580	5,342	46	1,338
4	330	150,390	137,100	9	165,423	121	20,406	10,523	52	2,487
All grades	1,126	361,740	327,170	10	398,223	122	52,370	24,965	48	6,055
										13,893

1/ Wise and May (9).

2/ Scribner scale.

3/ Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

4/ Percent of net log scale.

5/ Surfaced-dry.

6/ Percent of gross cubic volume.

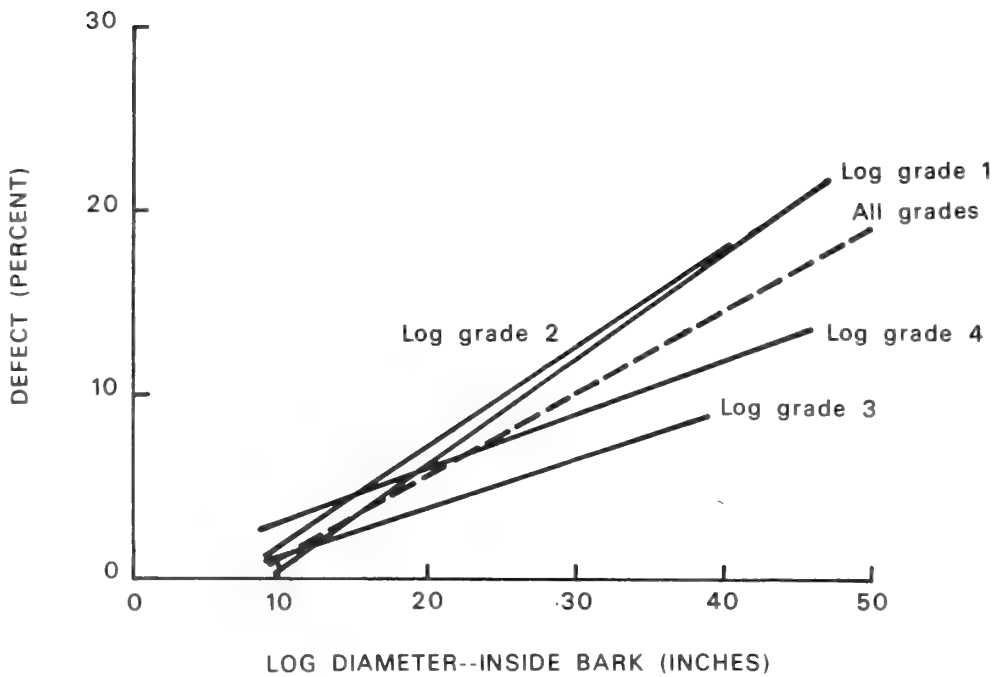


Figure 2.--Percent defect for each log grade and for all grades by log diameter.

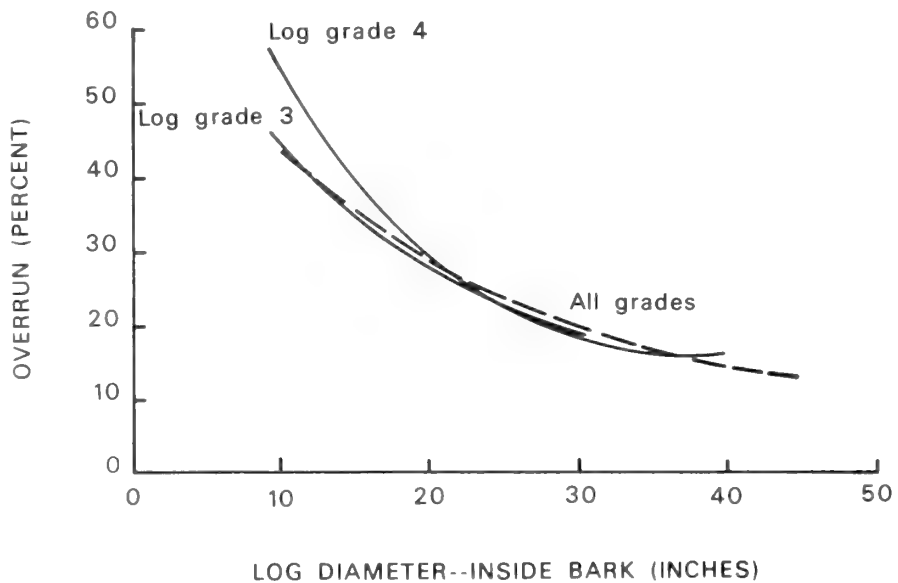


Figure 3.--Percent overrun for log grades 3 and 4 and for all grades by log diameter.

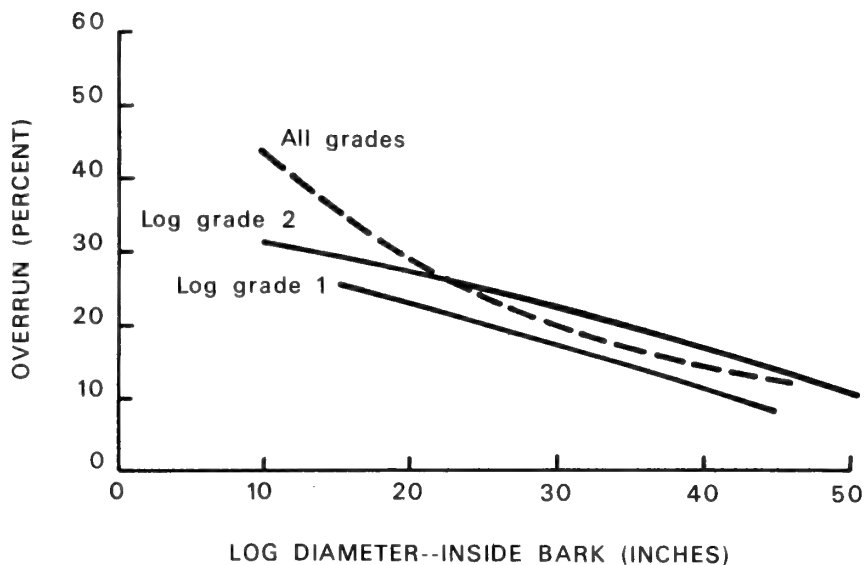


Figure 4.--Percent overrun for log grades 1 and 2 and for all grades by log diameter.

22.9 inches, respectively; and grade 4, 24.3 inches. For grade 1 logs, overrun averaged 15 percent; grades 2 and 4 each averaged 21 percent; and grade 3, 29 percent. The overrun for all logs averaged 22 percent. Comparable values for overrun were obtained from a previous study at this mill (3) and from a study of southern Oregon white fir.^{3/}

Since the cubic volumes of lumber tabulated in table 3 and appendix tables 10-14 are for surfaced-dry lumber, the addition of the cubic volumes of sawdust, residue, and lumber will not total to the

gross cubic volumes of the logs. The difference reflects losses incurred in processing rough-green lumber to the surfaced-dry condition. These losses include planer shavings, end trimming of finished lumber, and shrinkage.

Cubic recovery of lumber was highest in grade 4 logs, averaging 52 percent, and lowest in grade 1 logs with a recovery of 42 percent. Average recovery for grades 2 and 3 was 46 percent. The recovery for all logs averaged 48 percent. Cubic lumber recovery curves by log diameter and grade are presented in figures 5 and 6. Defects in higher grade logs tend to reduce the cubic recovery percentage of these logs.

^{3/} Paper in preparation.

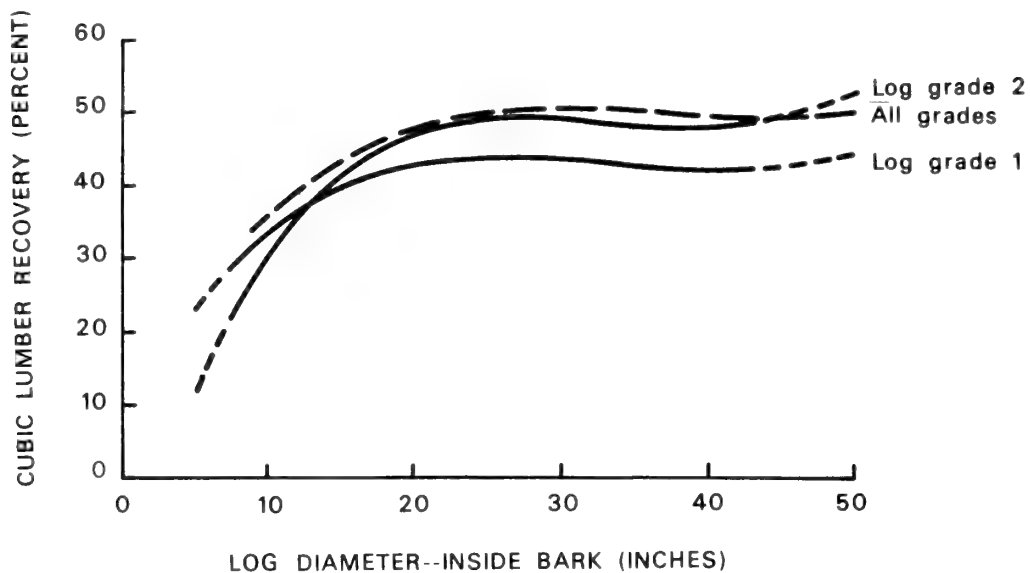


Figure 5.--Cubic volume of lumber recovered as percent of gross cubic log volume by log diameter for log grades 1 and 2 and for all grades.

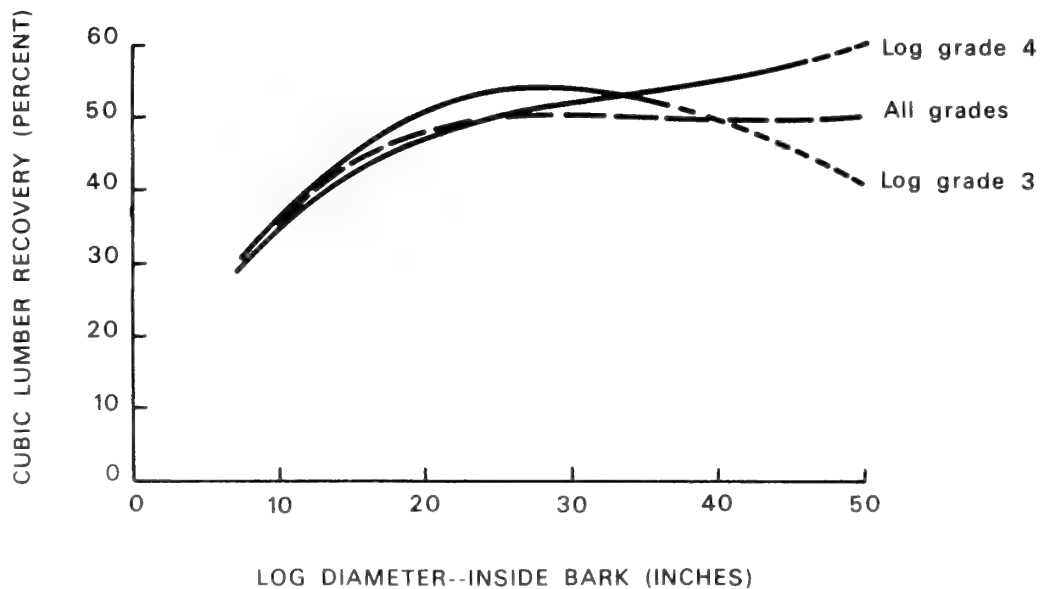


Figure 6.--Cubic volume of lumber recovered as percent of gross cubic log volume by log diameter for log grades 3 and 4 and for all grades.

LUMBER GRADE YIELDS BY LOG GRADE

The percent yields of various grades of surfaced-dry lumber for each grade of log and for all logs are presented in table 4. Lumber grade yields by scaling diameter for each log grade and for all grades are presented in the appendix tables 15-19.

A total of 19 different grades of lumber were produced. Most of the volume was concentrated in Shop and Dimension grades. Regardless of the grade of log, more than 80 percent of the total lumber tally was found in these two lumber grade groups. Yield of Shop grades was highest (41.3 percent, mostly in Moulding) from the grade 1 logs, and the lowest (11.3 percent), from grade 3 logs. For the Dimension grades of lumber, the reverse was true; the highest yield (81.7 percent) was from grade 3 logs, the lowest (40.8 percent) from grade 1 logs. Between these extremes were the yields of Shop and Dimension for grade 2 and grade 4 logs (table 4). The recovery of Shop and Dimension was approximately equal only in grade 1 logs; in all other log grades, the production of Dimension exceeded that of Shop. For all logs, approximately 29 percent of the total lumber volume was Shop and 59 percent, Dimension.

Most of the Selects came from the upper two grades of logs, with grade 1 logs producing twice (7.8 percent) that of grade 2 logs (3.9 percent). The remaining two log grades each produced less than 1 percent. Only 2.4 percent of the total lumber tally were Selects. Commons totaled approximately 1.5 percent of the lumber volume. Dunnage, which is a normal production item for the mill where the study was performed, totaled nearly 8 percent.

Most of the Dunnage was sawn from log grades 1, 2, and 4, each averaging

more than 8 percent of the lumber volume produced from these log grades. Grade 3 logs had a Dunnage volume of 4.2 percent.

LUMBER GRADE YIELD BY LOG DIAMETER CLASS

Figures 7-10 present recovery of various combinations of lumber items from logs of different grades divided into 6-inch log diameter classes. The following lumber items were combined for these graphs:

Selects - B, C, and D Select
High Shop - Moulding, Factory
Selects, No. 1 Shop
Low Shop - No. 2 and 3 Shop, Shop Outs
Std. & Btr. - No. 1 and 2 Dimension,
Construction, Standard,
1, 2, and 3 Common
Ut1Ec - No. 3 and 4 Dimension,
Utility, Economy, 4 and 5
Common
Dunnage - Dunnage

These figures indicate that for any given log grade, logs 24 inches and less in diameter produced predominately Dimension grades of lumber. Within this diameter range, recoveries of 70- to 95-percent Dimension were recorded. Logs larger than 24 inches, though still cutting heavy to Dimension, produced proportionately less Dimension with increasing log size.

The recovery of Shops and Selects generally increased with log size, with logs larger than 24 inches producing proportionately greater volumes of these lumber items. As expected, the highest yields of Selects were from the larger logs of grades 1 and 2. Yields of Shops were highest from the larger logs of grades 1, 2, and 4. An exceptionally high yield of Shops was also produced from 6- to 12-inch, grade 4 logs.

Logs larger than 24 inches also produced proportionately greater volumes of Dunnage.

Table 4.—Lumber grade yields from white and red fir logs by log grade

Lumber grade	Log grade ^{1/}				
	1	2	3	4	All grades
----- Percent lumber tally ^{2/} -----					
Select:					
B	2.36	1.03	0	0.06	0.58
C	2.53	.80	.09	.12	.60
D	2.88	2.05	.50	.61	1.22
Total	7.77	3.88	.59	.79	2.40
Shop:					
Moulding	25.47	12.32	1.92	3.74	8.23
Factory Selects	.03	.05	.04	.44	.21
1	2.64	3.47	1.45	6.12	3.99
2	7.15	9.71	4.05	16.08	10.70
3	4.80	5.03	2.86	5.76	4.81
Shop Out	1.21	1.01	1.01	.74	.93
Total	41.30	31.59	11.33	32.88	28.87
Dimension:					
No. 1 ^{3/}	17.48	24.30	33.27	11.68	20.15
No. 2 ^{4/}	6.87	11.52	21.24	15.31	14.66
No. 3 ^{5/}	9.35	11.42	19.14	19.38	16.20
No. 4 ^{6/}	7.12	7.64	8.07	9.34	8.37
Total	40.82	54.88	81.72	55.71	59.38
Common:					
1	.05	.14	.21	.05	.11
2	.13	.29	.50	.36	.34
3	.34	.45	1.08	.78	.71
4	.15	.27	.29	.40	.31
5	.11	.08	.04	.04	.06
Total	.78	1.23	2.12	1.63	1.53
Dunnage:	9.32	8.42	4.24	8.98	7.82
Number of logs	95	192	509	330	1,126
Lumber tally volume (board feet)	56,105	85,688	91,007	165,423	398,223

^{1/} Wise and May (9).

^{2/} Percentages may not total due to rounding.

^{3/} Includes Construction grade 2 x 4's.

^{4/} Includes Standard grade 2 x 4's.

^{5/} Includes Utility grade 2 x 4's.

^{6/} Includes Economy grade 2 x 4's.

GRADE 1

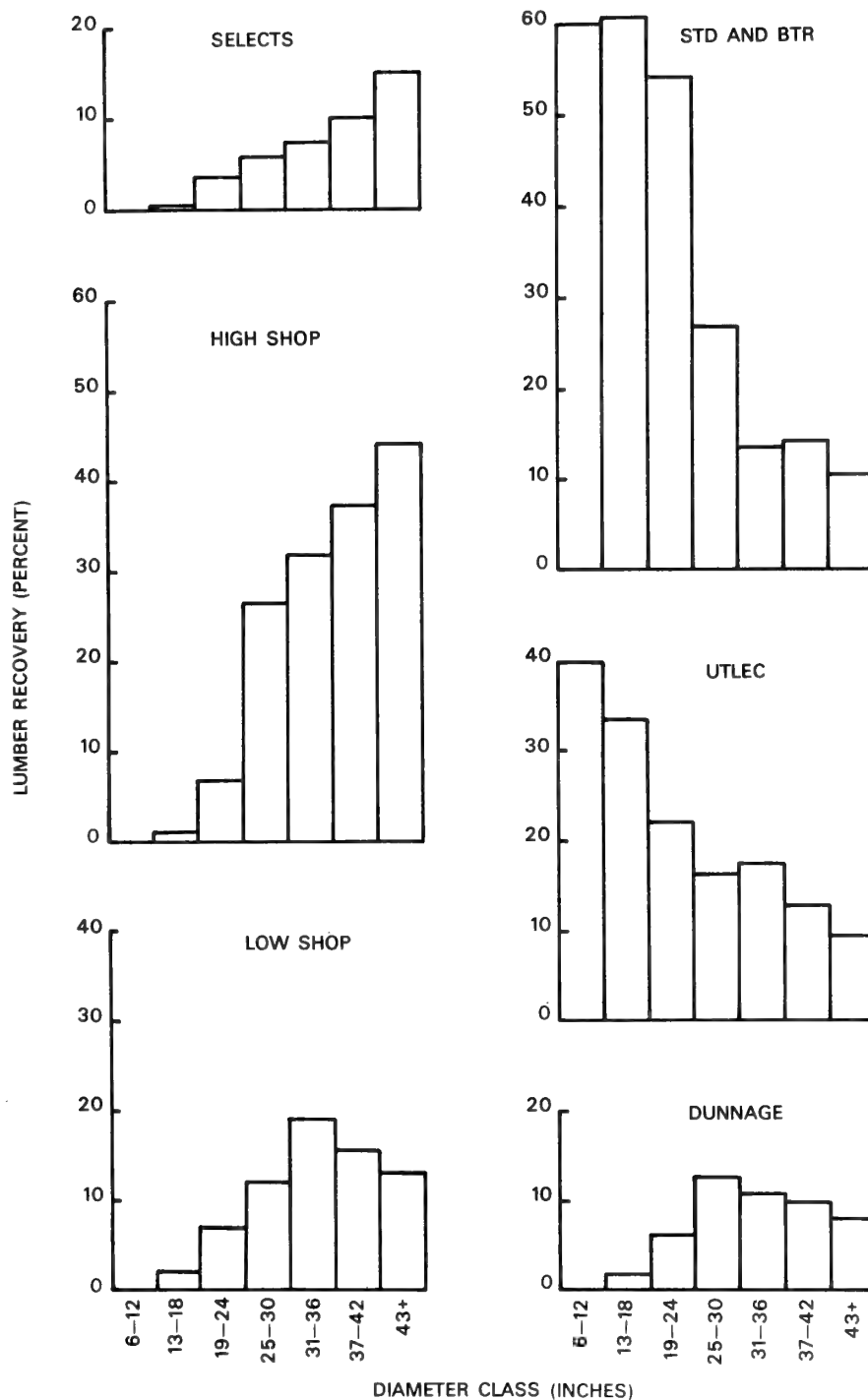


Figure 7.--Recovery of various lumber grade groups by 6-inch diameter classes, log grade No. 1. (For definition of lumber grade groups, see page 11.)

GRADE 2

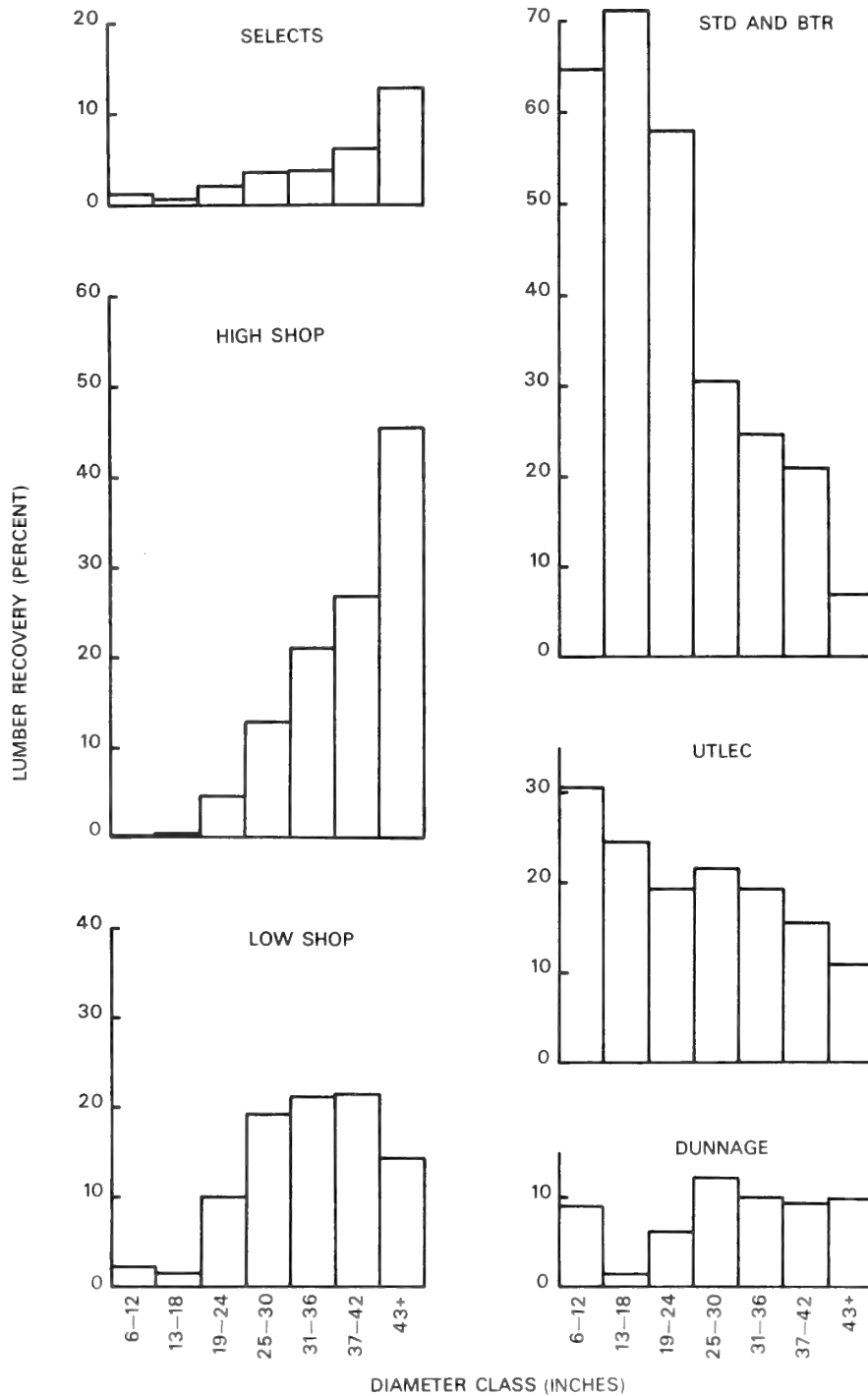


Figure 8.--Recovery of various lumber grade groups by 6-inch diameter classes, log grade No. 2. (For definition of lumber grade groups, see page 11.)

GRADE 3

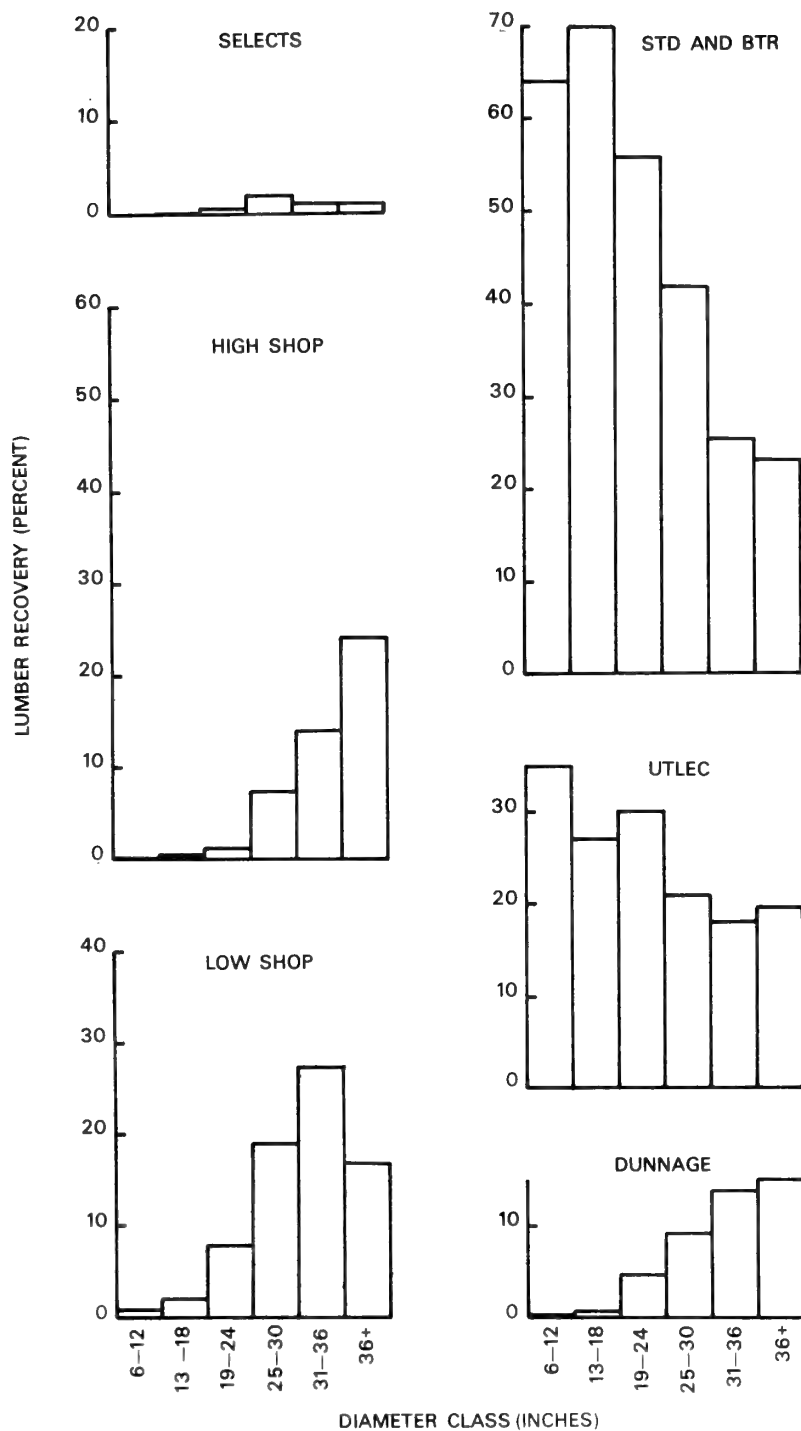


Figure 9.--Recovery of various lumber grade groups by 6-inch diameter classes, log grade No. 3.
(For definition of lumber grade groups, see page 11.)

GRADE 4

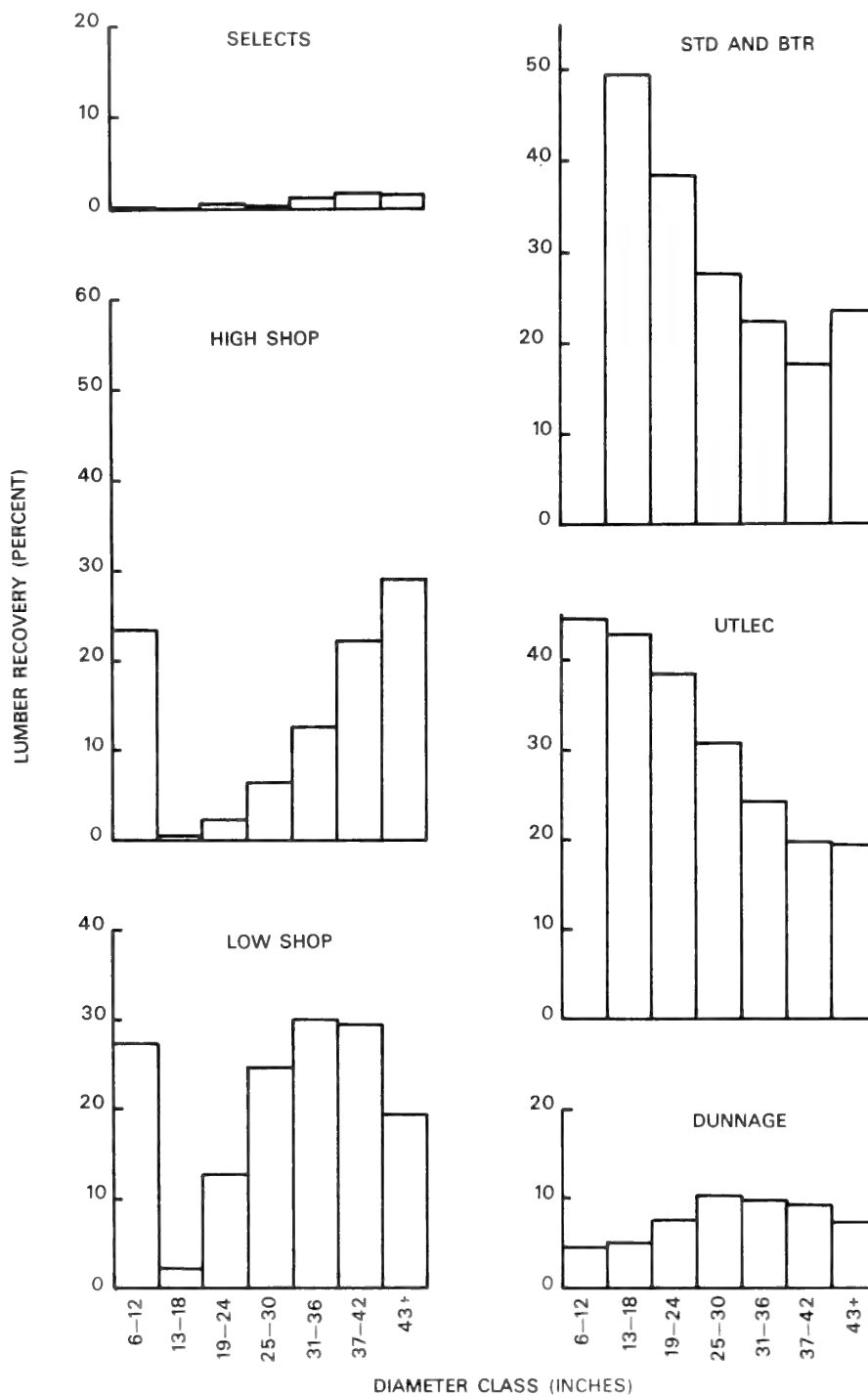


Figure 10.--Recovery of various lumber grade groups by 6-inch diameter classes, log grade No. 4. (For definition of lumber grade groups, see page 11.)

DISTRIBUTION OF LUMBER SIZES

The distribution of the study lumber by grade, thickness, and width for each log grade and for all log grades is presented in tables 5-9.

Except for a small volume of 4/4-inch, nearly all Shops and Selects were 5/4-inch-thick, random-width boards. From 12 to 49 percent of lumber produced from the various log grades was in this grade-size category. For all log grades (table 9), approximately 31 percent of the lumber was 5/4-inch Shops and Selects.

In the Dimension grades, nominal 2 x 4's were produced in greatest volume in log grades 1, 2, and 3 (tables 5-7). From 21 to 41 percent of the lumber volume from these log grades was in this grade-size category. Log grade 4 production of Dimension was greatest in 2 x 12's (table 8). In general, the production of Dimension was concentrated in 2 x 4's, 2 x 6's, and 2 x 12's, regardless of log grade. For all grades (table 9), the bulk of Dimension was in 2 x 4's (23.6 percent), 2 x 12's (18.2 percent), and 2 x 6's (13.0 percent).

SUMMARY

This report presents lumber recovery data from the processing of 1,126 logs from 234 red and white fir trees, selected from the central Sierra Nevada of California.

Grades 1 and 2 logs were found to be more defective than grades 3 and 4 logs, regardless of log diameter. For any given grade of log, the larger logs were the more defective.

In processing the 1,126 study logs, an overrun of 22 percent was found. Overrun was 15 percent for grade 1 logs, 21 percent for grades 2 and 4, and 29 percent for grade 3 logs. As expected, average

log size and the range of log sizes within a given log grade were important in overrun determination. Grade 3 logs were heavily concentrated in a narrow range of small diameter logs (7-23 inches); grades 1, 2, and 4 covered a wider range of log sizes (10-40 inches).

Cubic recovery of lumber ranged from 42 percent of gross cubic log volume in grade 1 logs to 52 percent in grade 4 logs. Grades 2 and 3 each registered a cubic recovery of 46 percent. For all logs, a cubic recovery of 48 percent was recorded. The lower recovery of higher grade logs is due in part to the higher occurrence of defect in these logs.

There were 19 different grades of lumber; most of the volume was concentrated in the Shop and Dimension grades. Together, these grades totaled more than 80 percent of the lumber volume produced from any log grade. For all logs, 59 percent of the volume produced was Dimension and 29 percent, Shop; the remainder consisted of Dunnage (7.8 percent), Selects (2.4 percent), and Commons (1.5 percent).

Logs less than 24 inches in diameter produced predominately Dimension grades of lumber with recoveries of 70 to 95 percent of the volume in these lumber items. Logs larger than 24 inches produced less Dimension and more Selects and Shops. Highest yields of Selects were from the larger logs of grades 1 and 2; yields of Shop were highest from larger logs of grades 1, 2, and 4.

Nearly all Shops and Selects were 5/4-inch-thick, random-width boards. Approximately 31 percent of the total lumber volume was of this size and these grades.

Of the Dimension lumber sawn, nominal 2 x 4's were produced in greatest volume from log grades 1, 2, and 3; from grade 4 logs, 2 x 12's were the predominate lumber size. In general, 2 x 4's, 2 x 6's, and 2 x 12's were the three major sizes of Dimension produced.

Table 5.—The distribution of study lumber by grade.

Thickness	Width	Lumber grade								
		B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
-- Inches --		-- Percent of lumber tally volume ^{5/} --								
4/4	4	0.01	0	0	0	0	0	0	0	0
	6	0	0	0.04	0.03	0	0	0	0	0
	8	0	0.03	.02	.09	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0
	12	0	0	0	.10	0	0	0	0	0
5/4	All	2.35	2.50	2.81	25.26	0.03	2.64	7.15	4.80	1.21
8/4	4	--	--	--	--	--	--	--	--	--
	6	--	--	--	--	--	--	--	--	--
	8	--	--	--	--	--	--	--	--	--
	10	--	--	--	--	--	--	--	--	--
	12	--	--	--	--	--	--	--	--	--
16/4	4	--	--	--	--	--	--	--	--	--
Grade totals		2.36	2.53	2.88	25.47	.03	2.64	7.15	4.80	1.21
Volume, board feet		1,324	1,421	1,614	14,289	15	1,483	4,013	2,695	680

^{1/} Also Construction grade 2 x 4's.

^{2/} Also Standard grade 2 x 4's.

^{3/} Also Utility grade 2 x 4's.

Table 6.—The distribution of study lumber by grade.

Thickness	Width	Lumber grade								
		B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
-- Inches --		-- Percent of lumber tally volume ^{5/} --								
4/4	4	0	0	0	0.02	0	0	0	0	0
	6	.01	.02	.02	.02	0	0	0	0	0
	8	0	.01	.03	.03	0	0	.03	0	0
	10	0	0	0	0	0	0	0	0	0
	12	0	.02	0	.07	0	0	0	0	0
5/4	All	1.02	.75	2.00	12.18	.05	3.47	9.68	5.03	1.01
8/4	4	--	--	--	--	--	--	--	--	--
	6	--	--	--	--	--	--	--	--	--
	8	--	--	--	--	--	--	--	--	--
	10	--	--	--	--	--	--	--	--	--
	12	--	--	--	--	--	--	--	--	--
16/4	4	--	--	--	--	--	--	--	--	--
Grade totals		1.03	.80	2.05	12.32	.05	3.47	9.71	5.03	1.01
Volume, board feet		881	683	1,753	10,557	40	2,976	8,321	4,310	865

^{1/} Also Construction grade 2 x 4's.

^{2/} Also Standard grade 2 x 4's.

^{3/} Also Utility grade 2 x 4's.

thickness, and width¹ for grade No. 1 white and red fir logs

Lumber grade (continued)										Size totals	Volume
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage		
----- Percent of lumber tally volume ^{5/} -----										----- Board feet -----	
--	--	--	--	0.01	0	0.03	0	0	--	0.04	22
--	--	--	--	0	.02	.06	.05	.03	--	.22	121
--	--	--	--	.02	0	.03	.02	.02	--	.22	126
--	--	--	--	0	0	0	0	0	--	0	0
--	--	--	--	.03	.11	.22	.09	.06	--	.61	342
--	--	--	--	--	--	--	--	--	--	48.77	27,360
14.12	3.49	2.44	0.71	--	--	--	--	--	--	20.76	11,648
2.74	1.26	1.41	.84	--	--	--	--	--	--	6.25	3,506
.02	.23	.35	.81	--	--	--	--	--	--	1.42	799
0	0	0	0	--	--	--	--	--	--	0	0
.60	1.89	5.15	4.76	--	--	--	--	--	--	12.39	6,952
--	--	--	--	--	--	--	--	--	9.32	9.32	5,229
17.48	6.87	9.35	7.12	.05	.13	.34	.15	.11	9.32	100.00	--
9,809	3,855	5,246	3,995	28	74	188	86	61	5,229	--	56,105

^{4/} Also Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

thickness, and width for grade No. 2 white and red fir logs

Lumber grade (continued)										Size totals	Volume
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage		
----- Percent of lumber tally volume ^{5/} -----										----- Board feet -----	
--	--	--	--	0	0.02	0.03	0.03	(6/)	--	0.10	87
--	--	--	--	.02	.01	.07	.05	(6/)	--	.22	191
--	--	--	--	.03	.06	.11	.01	0	--	.31	267
--	--	--	--	0	.02	0	0	0	--	.02	13
--	--	--	--	.09	.18	.24	.18	.07	--	.85	732
--	--	--	--	--	--	--	--	--	--	35.19	30,154
17.94	6.63	2.90	0.72	--	--	--	--	--	--	28.19	24,158
4.42	2.10	2.18	.86	--	--	--	--	--	--	9.55	8,182
.14	.34	.60	.90	--	--	--	--	--	--	1.98	1,693
0	.06	0	0	--	--	--	--	--	--	.06	54
1.81	2.39	5.75	5.16	--	--	--	--	--	--	15.10	12,940
--	--	--	--	--	--	--	--	--	8.42	8.42	7,217
24.30	11.52	11.42	7.64	.14	.29	.45	.27	.08	8.42	100.00	--
20,820	9,872	9,785	6,550	123	247	383	234	71	7,217	--	85,688

^{4/} Also Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

^{6/} Less than 0.005 percent.

Table 7.—The distribution of study lumber by grade,

Thickness	Width	Lumber grade								
		B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
-- Inches --		Percent of lumber tally volume ^{5/}								
4/4	4	0	0	(6/)	0.02	0	0	0	0	0
	6	0	0	0.03	.03	0	0	0	0	0
	8	0	0	0	0	0	0	0	0	0
	10	0	0	0	0	0	0	0	0	0
	12	0	0	0	0	0	0	0	0	0
5/4	All	0	.09	.47	1.87	.04	1.45	4.05	2.86	1.01
8/4	4	--	--	--	--	--	--	--	--	--
	6	--	--	--	--	--	--	--	--	--
	8	--	--	--	--	--	--	--	--	--
	10	--	--	--	--	--	--	--	--	--
	12	--	--	--	--	--	--	--	--	--
16/4	4	--	--	--	--	--	--	--	--	--
Grade totals		0	.09	.50	1.92	.04	1.45	4.05	2.86	1.01
Volume, board feet		0	82	460	1,743	36	1,316	3,689	2,603	920

^{1/} Also Construction grade 2 x 4's.

^{2/} Also Standard grade 2 x 4's.

^{3/} Also Utility grade 2 x 4's.

Table 8.—The distribution of study lumber by grade,

Thickness	Width	Lumber grade								
		B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
-- Inches --		Percent of lumber tally volume ^{5/}								
4/4	4	0	0	0	0	0	0	0	0	0
	6	0	0	(6/)	.02	0	0	0	0	0
	8	0	0	.01	.02	0	0	0	0	0
	10	0	0	.01	0	0	0	0	0	0
	12	0	0	.01	.04	0	0	0	0	0
5/4	All	0.06	.12	.58	3.66	.44	6.12	16.08	5.76	.74
8/4	4	--	--	--	--	--	--	--	--	--
	6	--	--	--	--	--	--	--	--	--
	8	--	--	--	--	--	--	--	--	--
	10	--	--	--	--	--	--	--	--	--
	12	--	--	--	--	--	--	--	--	--
16/4	4	--	--	--	--	--	--	--	--	--
Grade totals		.06	.12	.61	3.74	.44	6.12	16.08	5.76	.74
Volume, board feet		93	200	1,015	6,182	731	10,122	26,601	9,529	1,229

^{1/} Also Construction grade 2 x 4's.

^{2/} Also Standard Grade 2 x 4's.

^{3/} Also Utility grade 2 x 4's.

thickness, and width for grade No. 3 white and red fir logs

Lumber grade (continued)										Size totals	Volume
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage		
----- Percent of lumber tally volume ^{5/} -----										----- Board feet -----	
--	--	--	--	0.01	0.13	0.21	0.09	0.01	--	0.47	425
--	--	--	--	.06	.08	.45	.13	.01	--	.80	727
--	--	--	--	.10	.09	.17	.02	.02	--	.41	374
--	--	--	--	.01	0	0	0	0	--	.01	13
--	--	--	--	.02	.20	.24	.05	0	--	.51	460
--	--	--	--	--	--	--	--	--	--	11.84	10,776
20.99	12.56	5.95	1.77	--	--	--	--	--	--	41.27	37,562
9.05	4.91	3.89	1.82	--	--	--	--	--	--	19.66	17,896
.96	1.06	2.71	1.84	--	--	--	--	--	--	6.58	5,985
0	0	0	0	--	--	--	--	--	--	0	0
2.27	2.71	6.58	2.65	--	--	--	--	--	--	14.21	12,928
--	--	--	--	--	--	--	--	--	4.24	4.24	3,861
33.27	21.24	19.14	8.07	.21	.50	1.08	.29	.04	4.24	100.00	--
30,279	19,335	17,415	7,342	189	455	981	266	35	3,861	--	91,007

^{4/} Also Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

^{6/} Less than 0.005 percent.

thickness, and width for grade No. 4 white and red fir logs

Lumber grade (continued)										Size totals	Volume
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage		
----- Percent of lumber tally volume ^{5/} -----										----- Board feet -----	
--	--	--	--	(6/)	(6/)	0.01	0.02	(6/)	--	0.03	55
--	--	--	--	(6/)	0.01	.11	.08	0.01	--	.24	397
--	--	--	--	0.01	.06	.16	.09	.01	--	.35	580
--	--	--	--	.01	0	.02	.01	0	--	.05	77
--	--	--	--	.03	.29	.48	.21	.02	--	1.08	1,784
--	--	--	--	--	--	--	--	--	--	33.56	55,515
4.76	4.48	2.43	0.81	--	--	--	--	--	--	12.48	20,653
2.88	4.09	4.83	1.54	--	--	--	--	--	--	13.35	22,080
.32	.91	2.60	2.16	--	--	--	--	--	--	5.99	9,903
0	0	0	0	--	--	--	--	--	--	0	0
3.73	5.83	9.52	4.82	--	--	--	--	--	--	23.90	39,532
--	--	--	--	--	--	--	--	--	8.98	8.98	14,847
11.68	15.31	19.38	9.34	.05	.36	.78	.40	.04	8.98	100.00	--
19,320	25,323	32,074	15,451	83	596	1,296	669	62	14,847	--	165,423

^{4/} Also Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

^{6/} Less than 0.005 percent.

Table 9.—The distribution of study lumber by grade,

Thickness	Width	Lumber grade								
		B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
-- Inches --		-- Percent of lumber tally volume ^{5/} --								
4/4	4	(6/)	0	(6/)	0.01	0	0	0	0	0
	6	(6/)	(6/)	0.02	.02	0	0	0	0	0
	8	0	.01	.01	.03	0	0	.01	0	0
	10	0	0	(6/)	0	0	0	0	0	0
	12	0	(6/)	(6/)	.04	0	0	0	0	0
5/4	All	.57	.59	1.18	8.13	.21	3.99	10.70	4.81	.93
8/4	4	--	--	--	--	--	--	--	--	--
	6	--	--	--	--	--	--	--	--	--
	8	--	--	--	--	--	--	--	--	--
	10	--	--	--	--	--	--	--	--	--
	12	--	--	--	--	--	--	--	--	--
16/4	4	--	--	--	--	--	--	--	--	--
Grade totals		.58	.60	1.22	8.23	.21	3.99	10.70	4.81	.93
Volume, board feet		2,298	2,386	4,842	32,771	822	15,897	42,624	19,137	3,694

^{1/} Also Construction grade 2 x 4's.

^{2/} Also Standard grade 2 x 4's.

^{3/} Also Utility grade 2 x 4's.

thickness, and width for all white and red fir study logs

Lumber grade (continued)										Size totals	Volume
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage		
----- Percent of lumber tally volume ^{5/} ----- Board feet											
--	--	--	--	0.01	0.04	0.06	0.03	(6/)	--	0.15	589
--	--	--	--	.02	.03	.17	.08	0.01	--	.36	1,436
--	--	--	--	.04	.06	.13	.05	.01	--	.34	1,347
--	--	--	--	.01	(6/)	.01	(6/)	0	--	.03	103
--	--	--	--	.04	.22	.34	.15	.03	--	.83	3,318
--	--	--	--	--	--	--	--	--	--	31.09	123,805
12.62	6.65	3.34	1.00	--	--	--	--	--	--	23.61	94,021
4.60	3.45	3.56	1.36	---	--	--	--	--	--	12.97	51,664
.38	.73	1.88	1.63	--	--	--	--	--	--	4.61	18,380
0	.01	0	0	--	--	--	--	--	--	.01	54
2.54	3.82	7.42	4.39	---	--	--	--	--	--	18.17	72,352
--	--	--	--	--	--	--	--	--	7.82	7.82	31,154
20.15	14.66	16.20	8.37	.11	.34	.71	.31	.06	7.82	100.00	--
80,228	58,385	64,520	33,338	423	1,372	2,848	1,255	229	31,154	--	398,223

^{4/} Also Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

^{6/} Less than 0.005 percent.

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APPENDIX

Table 10.—Log scale, lumber tally, and cubic volumes by scaling diameter of white and red fir sawn-length logs, log grade No. 1

Log scaling diameter (inches)	Number of logs	Log scale ^{1/}		Lumber tally		Cubic volume ^{2/}				
		Gross	Net	Volume	Recovery ^{3/}	Log	Lumber ^{4/}	Lumber recovery ^{5/}	Sawdust	Residue
----- Board feet ----- Percent ----- Cubic feet ----- Percent ----- Cubic feet -----										
11	2	120	110	144	131	24.07	8.03	33	2.13	11.47
12	2	160	160	155	97	29.61	8.49	29	2.23	16.37
13	0	--	--	--	--	--	--	--	--	--
14	0	--	--	--	--	--	--	--	--	--
15	3	420	420	603	144	72.98	34.15	47	8.42	20.74
16	5	800	790	1,000	127	144.37	57.20	40	14.51	56.04
17	3	540	530	725	137	93.63	40.77	44	10.50	30.36
18	3	630	600	768	128	109.25	44.35	41	10.75	41.75
19	4	960	920	1,152	125	157.19	66.94	43	17.41	52.16
20	1	280	240	214	89	55.27	12.33	22	2.86	36.80
21	5	1,500	1,410	1,835	130	235.43	107.08	45	26.90	69.85
22	5	1,650	1,550	1,979	128	270.41	117.27	43	29.09	89.56
23	4	1,520	1,420	1,774	125	229.50	107.01	47	26.95	63.10
24	4	1,600	1,490	1,794	120	249.20	109.54	44	27.24	79.27
25	5	2,300	1,970	2,150	109	344.39	136.21	40	33.88	131.68
26	5	2,500	2,360	2,530	107	383.36	160.87	42	39.40	133.80
27	2	1,100	960	1,052	110	168.66	70.09	42	16.64	60.84
28	2	1,160	1,040	1,214	117	144.31	79.90	55	19.26	20.49
29	2	1,220	1,110	1,349	122	206.36	90.96	44	21.63	65.92
30	3	1,810	1,430	1,701	119	277.50	113.39	41	27.42	101.65
31	3	2,130	1,720	1,762	102	325.42	121.56	37	29.88	134.53
32	5	3,700	3,050	3,776	124	590.45	251.37	43	60.09	202.39
33	4	3,120	2,750	2,904	106	431.80	194.46	45	46.44	131.20
34	0	--	--	--	--	--	--	--	--	--
35	4	3,520	3,070	3,447	112	563.22	236.50	42	57.50	194.23
36	1	1,150	890	1,077	121	175.11	72.08	41	17.25	63.31
37	3	3,090	2,070	2,598	126	508.04	178.46	35	43.43	228.97
38	3	3,210	2,810	3,132	111	518.36	215.57	42	52.21	182.07
39	3	3,360	2,800	3,599	129	491.11	241.88	49	59.88	111.82
40	2	2,400	2,160	2,500	116	363.32	171.12	47	42.15	94.87
41	1	1,270	1,100	1,180	107	193.82	79.40	41	19.21	70.61
42	0	--	--	--	--	--	--	--	--	--
43	0	--	--	--	--	--	--	--	--	--
44	4	5,550	4,790	5,053	105	804.65	347.59	43	85.54	258.86
45	0	--	--	--	--	--	--	--	--	--
46	0	--	--	--	--	--	--	--	--	--
47	0	--	--	--	--	--	--	--	--	--
48	0	--	--	--	--	--	--	--	--	--
49	1	1,800	1,600	1,617	101	240.88	111.43	46	27.51	66.26
50	1	1,870	1,350	1,321	98	264.71	92.65	35	23.87	116.07
Total	95	56,440	48,670	56,105	115	8,666.38	3,678.65	42	902.18	2,937.04

^{1/} Scribner scale.

^{2/} Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

^{3/} Percent of net log scale.

^{4/} Surfaced-dry.

^{5/} Percent of gross cubic volume.

Table 11.—Log scale, lumber tally, and cubic volumes by scaling diameter of white and red fir sawn-length logs, log grade No. 2

Log scaling diameter (inches)	Number of logs	Log scale ^{1/}		Lumber tally		Cubic volume ^{2/}				
		Gross	Net	Volume	Recovery ^{3/}	Log	Lumber ^{4/}	Lumber recovery ^{5/}	Sawdust	Residue
- - - - - Board feet - - - - - Percent - - - Cubic feet - - - Percent - - - Cubic feet - - -										
8	1	30	30	44	147	12.17	2.48	20	0.62	8.36
9	4	150	140	151	108	39.31	8.58	22	2.18	26.03
10	6	300	290	354	122	63.44	20.36	32	5.16	31.94
11	6	420	390	436	112	80.06	24.31	30	6.61	41.58
12	6	480	470	518	110	102.37	29.21	29	7.56	56.88
13	6	600	580	822	142	107.96	45.43	42	12.12	36.65
14	10	1,030	1,010	1,461	145	203.71	82.59	41	21.46	75.05
15	8	1,070	1,020	1,425	140	180.59	80.57	45	20.35	56.38
16	10	1,600	1,530	1,945	127	281.47	108.91	39	28.15	112.35
17	8	1,400	1,330	1,820	137	239.81	103.10	43	26.11	80.69
18	7	1,470	1,410	1,778	126	258.58	102.24	40	24.90	102.79
19	7	1,650	1,530	2,163	141	253.74	126.16	50	30.22	62.49
20	8	2,240	2,130	2,674	126	317.11	158.10	50	39.46	72.69
21	9	2,700	2,610	3,309	127	464.24	194.41	42	47.79	165.97
22	7	2,310	2,200	2,918	133	317.40	172.15	54	43.24	50.80
23	9	3,420	3,100	3,807	123	518.55	230.71	44	58.37	158.36
24	6	2,450	2,310	2,865	124	329.67	174.59	53	43.99	57.29
25	9	4,080	3,730	4,295	115	582.54	265.93	46	65.75	170.47
26	1	500	470	586	125	63.65	36.13	57	8.96	7.66
27	5	2,750	2,190	2,473	113	355.80	161.76	45	38.79	105.70
28	3	1,740	1,630	1,782	109	222.91	115.86	52	27.61	44.44
29	9	5,640	4,290	5,527	129	785.80	354.19	45	83.42	244.40
30	4	2,550	1,910	2,121	111	391.44	135.24	35	33.87	179.50
31	6	4,260	4,000	4,475	112	551.12	292.18	53	71.25	97.91
32	5	3,510	3,190	3,787	119	443.62	240.30	54	59.02	71.39
33	5	3,710	3,140	3,935	125	558.76	262.20	47	62.31	154.92
34	4	3,200	2,910	3,349	115	434.71	225.48	52	53.76	86.12
35	4	3,730	3,240	3,809	118	477.65	252.12	53	60.92	87.45
36	2	1,840	1,470	1,935	132	290.31	125.41	43	29.13	99.19
37	4	4,250	3,730	4,256	114	581.71	281.56	48	69.64	141.29
38	3	3,210	2,810	3,174	113	424.73	212.97	50	52.07	92.63
39	1	1,120	1,060	1,157	109	136.16	76.82	56	19.32	15.22
40	2	2,400	2,180	2,359	108	316.55	160.93	51	38.70	66.72
41	1	1,430	960	1,411	147	280.49	93.45	33	23.04	134.54
42	2	2,350	1,640	1,929	118	306.16	126.83	41	30.86	109.35
43	0	--	--	--	--	--	--	--	--	--
44	2	2,960	1,940	2,703	139	457.33	189.14	41	46.15	160.60
45	0	--	--	--	--	--	--	--	--	--
46	0	--	--	--	--	--	--	--	--	--
47	0	--	--	--	--	--	--	--	--	--
48	1	1,080	940	980	104	128.30	68.88	54	16.74	20.69
49	1	1,350	1,150	1,155	100	157.15	79.46	51	19.46	32.68
Total	192	80,980	70,660	85,688	121	11,717.07	5,420.74	46	1,329.06	3,319.17

^{1/} Scribner scale.

^{2/} Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

^{3/} Percent of net log scale.

^{4/} Surfaced-dry.

^{5/} Percent of gross cubic volume.

**Table 12.—Log scale, lumber tally, and cubic volumes by scaling diameter of
white and red fir sawn-length logs, log grade No. 3**

Log scaling diameter (inches)	Number of logs	Log scale ^{1/}		Lumber tally		Cubic volume ^{2/}				
		Gross	Net	Volume	Recovery ^{3/}	Log	Lumber ^{4/}	Lumber recovery ^{5/}	Sawdust	Residue
- - - - - board feet - - - - - Percent - - - Cubic feet - - - Percent - - - Cubic feet - - -										
7	6	120	120	161	134	33.26	9.02	27	2.58	18.74
8	55	1,310	1,290	2,095	162	361.16	118.93	33	30.31	177.27
9	46	1,570	1,520	2,267	149	377.25	128.32	34	32.75	178.55
10	53	2,630	2,600	3,323	128	549.08	186.90	34	48.12	258.82
11	54	3,370	3,340	4,139	124	653.12	231.38	35	61.19	290.70
12	43	3,330	3,230	4,738	147	647.69	265.84	41	69.49	232.96
13	35	3,160	3,100	3,995	129	557.86	224.39	40	58.22	208.64
14	30	3,230	3,200	4,514	141	591.02	254.17	43	66.06	195.12
15	33	4,500	4,410	5,942	135	742.04	336.49	45	86.08	220.83
16	23	3,580	3,500	4,756	136	564.69	269.01	48	67.98	150.10
17	22	3,840	3,730	5,028	135	630.66	285.51	45	72.68	189.09
18	14	2,970	2,920	3,909	134	449.24	222.79	50	56.70	104.49
19	17	3,990	3,880	5,296	136	591.29	307.43	52	75.09	121.64
20	15	4,260	4,190	5,411	129	582.04	308.35	53	78.61	104.46
21	9	2,740	2,710	3,473	128	381.87	200.52	53	51.01	70.79
22	8	2,690	2,550	3,380	133	381.63	199.27	52	48.76	75.97
23	10	3,700	3,370	4,281	127	554.00	258.53	47	61.57	160.47
24	3	1,200	1,120	1,504	134	172.73	90.50	52	22.59	32.32
25	6	2,820	2,750	3,107	113	356.58	191.35	54	45.84	63.86
26	5	2,500	2,260	2,984	132	349.83	183.01	52	42.96	71.76
27	3	1,650	1,560	1,909	122	202.90	119.10	59	29.54	17.86
28	4	2,320	2,260	2,392	106	288.62	148.47	51	37.73	55.60
29	4	2,440	2,260	2,688	119	311.72	166.15	53	40.64	55.19
30	1	660	620	682	110	81.19	45.82	56	10.98	10.25
31	2	1,420	1,320	1,345	102	178.78	87.99	49	21.79	41.12
32	3	2,220	1,930	2,180	113	276.54	141.33	51	33.37	59.75
33	0	--	--	--	--	--	--	--	--	--
34	2	1,600	1,500	1,734	116	207.76	114.44	55	26.86	32.64
35	0	--	--	--	--	--	--	--	--	--
36	0	--	--	--	--	--	--	--	--	--
37	0	--	--	--	--	--	--	--	--	--
38	0	--	--	--	--	--	--	--	--	--
39	1	1,120	1,020	1,056	104	139.66	70.14	50	16.01	33.21
40	0	--	--	--	--	--	--	--	--	--
41	0	--	--	--	--	--	--	--	--	--
42	0	--	--	--	--	--	--	--	--	--
43	1	1,400	1,130	1,372	121	165.14	89.50	54	21.66	26.46
44	0	--	--	--	--	--	--	--	--	--
45	0	--	--	--	--	--	--	--	--	--
46	1	1,590	1,350	1,346	100	201.18	87.46	43	20.39	67.83
Total	509	73,930	70,740	91,007	129	11,580.53	5,342.11	46	1,337.56	3,326.49

^{1/} Scribner scale.

^{2/} Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

^{3/} Percent of net log scale.

^{4/} Surfaced-dry.

^{5/} Percent of gross cubic volume.

Table 13.—Log scale, lumber tally, and cubic volumes by scaling diameter of white and red fir sawn-length logs, log grade No. 4

Log scaling diameter (inches)	Number of logs	Log scale ^{1/}		Lumber tally		Cubic volume ^{2/}					
		Gross	Net	Volume	Recovery ^{3/}	Log	Lumber ^{4/}	Lumber recovery ^{5/}	Sawdust	Residue	
		----- Board feet -----		----- Percent -----		----- Cubic feet -----		----- Percent -----		----- Cubic feet -----	
9	3	100	80	122	152	29.80	6.96	23	1.72	19.13	
10	10	490	480	817	170	131.46	46.26	35	11.48	60.61	
11	2	90	90	109	121	19.58	6.23	32	1.63	9.86	
12	9	620	620	970	156	135.16	55.28	41	13.58	50.73	
13	8	600	600	925	154	119.60	52.09	44	13.48	38.64	
14	8	770	760	1,070	141	151.70	62.53	41	14.90	57.19	
15	6	760	740	1,003	136	136.17	57.83	42	13.64	49.03	
16	22	3,220	3,080	4,294	139	560.81	247.45	44	58.46	187.81	
17	15	2,400	2,310	3,116	135	395.51	180.90	46	41.31	125.86	
18	11	2,050	1,850	2,546	138	329.52	152.49	46	34.34	102.45	
19	17	3,540	3,390	4,424	131	553.67	260.42	47	62.09	158.24	
20	15	3,750	3,470	4,145	119	560.71	245.90	44	56.72	191.45	
21	12	3,400	3,220	4,260	132	503.04	251.59	50	58.69	123.70	
22	12	3,690	3,510	4,505	128	545.39	273.32	50	66.96	123.69	
23	11	3,930	3,620	4,571	126	553.35	283.86	51	65.89	123.77	
24	12	4,750	4,260	5,617	132	687.15	347.61	51	80.76	160.93	
25	12	5,230	4,750	5,568	117	709.73	350.41	49	79.48	182.32	
26	12	5,170	4,800	5,811	121	693.50	358.11	52	84.14	149.06	
27	17	9,270	8,050	9,163	114	1,203.04	579.35	48	134.73	322.32	
28	7	3,920	3,580	4,355	122	516.12	279.48	54	66.36	87.39	
29	17	10,280	9,570	11,094	116	1,353.93	711.66	53	166.43	268.36	
30	16	10,220	9,490	11,147	117	1,335.00	716.20	54	166.70	244.71	
31	6	4,170	3,730	4,395	118	533.00	286.21	54	67.27	95.31	
32	9	6,280	5,790	6,975	120	826.87	448.36	54	106.41	139.47	
33	6	4,680	3,650	5,258	144	636.17	341.70	54	78.22	118.23	
34	10	7,800	7,030	8,468	120	1,054.47	561.04	53	131.22	195.68	
35	9	7,920	7,280	8,482	117	1,024.82	558.74	55	134.73	160.21	
36	7	6,560	5,680	7,139	126	854.60	466.40	55	113.68	130.93	
37	6	6,180	5,680	6,068	107	770.04	406.30	53	97.33	141.43	
38	3	3,210	3,010	3,443	114	398.34	228.22	57	54.05	46.40	
39	7	7,840	6,970	7,947	114	974.16	530.14	54	127.02	152.93	
40	2	2,400	2,230	2,366	106	286.30	161.12	56	38.14	37.42	
41	5	6,350	5,680	6,583	116	777.29	436.05	56	105.35	100.82	
42	2	2,680	2,430	2,615	108	319.01	176.36	55	42.21	45.95	
43	0	---	---	---	---	---	---	---	---	---	
44	2	2,960	2,740	2,833	103	349.56	187.90	54	46.23	55.76	
45	1	1,520	1,410	1,678	119	184.68	103.17	56	25.60	24.61	
46	1	1,590	1,470	1,541	105	192.80	105.78	55	25.72	27.78	
Total	330	150,390	137,100	165,423	121	20,406.05	10,523.42	52	2,486.67	4,310.18	

^{1/} Scribner scale.

^{2/} Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

^{3/} Percent of net log scale.

^{4/} Surfaced-dry.

^{5/} Percent of gross cubic volume.

**Table 14.—Log scale, lumber tally, and cubic volumes by scaling diameter of
white and red fir sawn-length logs, all logs**

Log scaling diameter (inches)	Number of logs	Log scale ^{1/}		Lumber tally		Cubic volume ^{2/}					
		Gross	Net	Volume	Recovery ^{3/}	Log	Lumber ^{4/}	Lumber recovery ^{5/}	Sawdust	Residues	
		Board feet		Percent		Cubic feet		Percent		Cubic feet	
7	6	120	120	161	134	33.26	9.02	27	2.58	18.74	
8	56	1,340	1,320	2,139	162	373.33	121.41	33	30.93	185.63	
9	53	1,820	1,740	2,540	146	446.36	143.86	32	36.65	223.71	
10	69	3,420	3,370	4,494	133	743.98	253.52	34	64.76	351.37	
11	64	4,000	3,930	4,828	123	776.83	269.95	35	71.56	353.61	
12	60	4,590	4,480	6,381	142	914.83	358.82	39	92.86	356.94	
13	49	4,360	4,280	5,742	134	785.42	321.91	41	83.82	283.93	
14	48	5,030	4,970	7,045	142	946.43	399.29	42	102.42	327.36	
15	50	6,750	6,590	8,973	136	1,131.78	509.04	45	128.49	346.98	
16	60	9,200	8,900	11,995	135	1,551.34	682.57	44	169.10	506.30	
17	48	8,180	7,900	10,689	135	1,359.61	610.28	45	150.60	426.00	
18	35	7,120	6,780	9,001	133	1,146.59	521.87	46	126.69	351.48	
19	45	10,140	9,720	13,035	134	1,555.89	760.95	49	184.81	394.53	
20	39	10,530	10,030	12,444	124	1,515.13	724.68	48	177.65	405.40	
21	35	10,340	9,950	12,877	129	1,584.58	753.60	48	184.39	430.31	
22	32	10,340	9,810	12,782	130	1,514.83	762.01	50	188.05	340.02	
23	34	12,570	11,510	14,433	125	1,855.40	880.11	47	212.78	505.70	
24	25	10,000	9,180	11,780	128	1,438.75	722.24	50	174.58	329.81	
25	32	14,430	13,200	15,120	115	1,993.24	943.90	47	224.95	548.33	
26	23	10,670	9,890	11,911	120	1,490.34	738.12	50	175.46	362.28	
27	27	14,770	12,760	14,597	114	1,930.40	930.30	48	219.70	506.72	
28	16	9,140	8,510	9,743	114	1,171.96	623.71	53	150.96	207.92	
29	32	19,580	17,230	20,658	120	2,657.81	1,322.96	50	312.12	633.87	
30	24	15,240	13,450	15,651	116	2,085.13	1,010.65	48	238.97	536.11	
31	17	11,980	10,770	11,977	111	1,588.32	787.94	50	190.19	368.87	
32	22	15,710	13,960	16,718	120	2,137.48	1,081.36	51	258.89	473.00	
33	15	11,510	9,540	12,097	127	1,626.73	798.36	49	186.97	404.35	
34	16	12,600	11,440	13,551	118	1,696.94	900.96	53	211.84	314.44	
35	17	15,170	13,590	15,738	116	2,065.69	1,047.36	51	253.15	441.89	
36	10	9,550	8,040	10,151	126	1,320.02	663.89	50	160.06	293.43	
37	13	13,520	11,480	12,922	113	1,859.79	866.32	47	210.40	511.69	
38	9	9,630	8,630	9,749	113	1,341.43	656.76	49	158.33	321.10	
39	12	13,440	11,850	13,759	116	1,741.09	918.98	53	222.23	313.18	
40	6	7,220	6,570	7,225	110	966.17	493.17	51	118.99	199.01	
41	7	9,050	7,740	9,174	119	1,251.60	608.90	49	147.60	305.97	
42	4	5,030	4,070	4,544	112	625.17	303.19	48	73.07	155.30	
43	1	1,400	1,130	1,372	121	165.14	89.50	54	21.66	26.46	
44	8	11,470	9,470	10,589	112	1,611.54	724.63	45	177.92	475.22	
45	1	1,520	1,410	1,678	119	184.68	103.17	56	25.60	24.61	
46	2	3,180	2,820	2,887	102	393.98	193.24	49	46.11	95.61	
47	0	--	--	--	--	--	--	--	--	--	
48	1	1,080	940	980	104	128.30	68.88	54	16.74	20.69	
49	2	3,150	2,750	2,772	101	398.03	190.89	48	46.97	98.94	
50	1	1,870	1,350	1,321	98	264.71	92.65	35	23.87	116.07	
Total	1,126	361,740	327,170	398,223	122	52,370.03	24,964.92	48	6,055.47	13,892.88	

^{1/} Scribner scale.

^{2/} Volumes of lumber, sawdust, and residue do not total the log volume due to losses from surfacing, end trimming of surfaced-dry lumber, and shrinkage.

^{3/} Percent of net log scale.

^{4/} Surfaced dry.

^{5/} Percent of gross cubic volume.

Table 15.—Lumber grade yields by scaling

Log scaling diameter (inches)	Number of logs	Lumber tally volume	Lumber grade								
			B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
			Board feet -----Percent of lumber tally volume ^{5/} -----								
11	2	144	0	0	0	0	0	0	0	0	0
12	2	155	0	0	0	0	0	0	0	0	0
13	0	--	--	--	--	--	--	--	--	--	--
14	0	--	--	--	--	--	--	--	--	--	--
15	3	603	0	0	0	0	0	0	0	0	1.99
16	5	1,000	0	0	1.70	.80	0	0	0	0	3.40
17	3	725	0	0	0	0	0	0	0	2.21	0
18	3	768	0	0	0	3.91	0	0	0	0	0
19	4	1,152	0	0	2.86	5.99	0	0	0	3.65	3.47
20	1	214	0	0	3.74	0	0	0	0	0	0
21	5	1,835	0	0	.71	5.94	0	.54	.44	3.71	.49
22	5	1,979	0	.35	3.08	7.73	0	0	1.41	1.41	1.36
23	4	1,774	.68	3.16	2.59	6.54	0	1.52	2.14	5.24	0
24	4	1,794	0	.95	3.68	6.35	0	0	5.35	6.58	.39
25	5	2,150	.93	1.07	3.72	21.58	0	.84	2.65	4.56	1.07
26	5	2,530	0	.59	1.34	21.07	0	0	4.35	8.02	.79
27	2	1,052	1.05	1.71	2.57	23.67	0	4.75	11.60	4.37	.57
28	2	1,214	0	4.12	7.41	19.28	0	2.47	6.59	6.18	.82
29	2	1,349	1.33	0	4.00	37.51	0	1.26	4.74	2.37	3.85
30	3	1,701	.47	.76	6.82	26.40	0	5.64	5.88	4.12	1.18
31	3	1,762	2.44	1.76	2.78	33.31	0	2.16	11.01	7.21	5.67
32	5	3,776	2.04	.93	2.99	20.37	0	3.28	14.72	6.49	0
33	4	2,904	.21	4.92	5.37	26.07	0	3.34	11.85	2.96	.24
34	0	--	--	--	--	--	--	--	--	--	--
35	4	3,447	1.51	3.39	.49	38.56	.44	3.02	11.81	6.09	1.16
36	1	1,077	1.86	5.85	2.32	29.06	0	0	7.24	5.57	1.95
37	3	2,598	--	2.08	2.23	38.49	0	3.89	11.24	7.31	1.35
38	3	3,132	12.39	3.38	3.45	31.96	0	5.56	5.30	2.97	.38
39	3	3,599	1.69	3.53	2.45	26.23	0	5.83	13.06	6.36	.36
40	2	2,500	3.88	3.32	5.68	41.96	0	1.88	3.44	4.16	0
41	1	1,180	0	0	0	24.83	0	2.54	16.69	7.37	4.24
42	0	--	--	--	--	--	--	--	--	--	--
43	0	--	--	--	--	--	--	--	--	--	--
44	4	5,053	7.52	5.24	3.15	37.07	0	4.67	5.78	4.20	2.06
45	0	--	--	--	--	--	--	--	--	--	--
46	0	--	--	--	--	--	--	--	--	--	--
47	0	--	--	--	--	--	--	--	--	--	--
48	0	--	--	--	--	--	--	--	--	--	--
49	1	1,617	4.02	8.66	1.05	37.91	0	.80	11.75	4.51	.37
50	1	1,321	5.00	4.39	2.80	55.03	0	4.62	2.88	6.81	2.42
Total	95	56,105	2.36	2.53	2.88	25.47	.03	2.64	7.15	4.80	1.21

^{1/} Includes Construction grade 2 x 4's.^{2/} Includes Standard grade 2 x 4's.^{3/} Includes Utility grade 2 x 4's.

diameter for grade No. 1 white and red fir logs

Lumber grade (continued)									
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage
----- Percent of lumber tally volume ^{5/} -----									
26.39	23.61	25.00	19.44	0	0	5.56	0	0	0
47.10	17.42	16.13	19.35	0	0	0	0	0	0
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52.90	4.98	21.72	17.41	0	.99	0	0	0	0
30.20	14.90	32.60	13.60	0	.40	2.40	0	0	0
49.93	20.14	14.07	12.55	0	0	1.10	0	0	0
52.47	17.06	12.24	6.64	0	0	0	0	0	7.68
38.89	20.57	15.63	8.94	0	0	0	0	0	0
19.16	3.27	30.84	42.99	0	0	0	0	0	0
49.43	10.14	9.21	15.04	0	0	0	.87	0	3.49
43.86	8.24	23.40	2.68	0	0	.15	0	0	6.32
41.71	13.02	8.68	6.60	0	0	0	.90	0	7.22
44.70	6.47	9.75	2.62	0	0	0	.39	0	12.76
26.52	4.98	12.18	7.30	.74	.74	.56	0	0	10.56
25.73	9.53	11.39	4.03	0	0	.63	.44	0	12.09
18.63	4.94	7.13	5.32	0	0	0	0	0	13.69
24.96	7.91	3.54	1.81	0	0	0	0	0	14.91
11.71	3.11	10.82	5.41	0	0	0	0	0	13.86
5.70	4.94	13.64	9.23	0	.94	.82	0	0	13.46
3.41	2.50	3.63	9.31	0	0	1.59	0	1.25	11.98
10.43	6.54	10.25	8.45	0	0	.29	.21	0	13.00
9.13	5.85	8.99	11.23	0	0	0	0	0	9.85
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8.33	4.41	6.38	5.92	0	0	0	0	0	8.50
5.57	2.97	13.00	12.26	0	0	0	0	0	12.35
2.58	3.66	4.04	13.28	0	0	0	0	0	9.85
6.61	9.32	4.28	1.98	.29	0	.22	0	0	11.91
9.89	9.37	6.95	4.89	0	.44	0	.11	.25	8.59
10.20	2.32	7.00	4.36	0	.64	1.44	0	.32	9.40
6.10	3.64	11.27	11.27	0	0	0	0	1.86	10.17
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7.08	3.40	4.77	4.77	.06	0	.42	0	0	9.82
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7.24	6.37	8.23	1.18	0	0	0	1.48	0	6.43
2.50	2.35	2.73	5.22	0	0	0	0	0	3.26
17.48	6.87	9.35	7.12	.05	.13	.34	.15	.11	9.32

^{4/} Includes Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

Table 16.—Lumber grade yields by scaling

Log scaling diameter (inches)	Number of logs	Lumber tally volume	Lumber grade								
			B	C	D	Moulding	Factory Select	1	2	3	Shop Out
			Select	Select	Select			Shop	Shop	Shop	
Board feet			Percent of lumber tally volume ^{5/}								
8	1	44	0	0	0	0	0	0	0	0	0
9	4	151	0	0	0	0	0	0	0	0	2.65
10	6	354	0	0	0	1.41	0	0	4.80	0	0
11	6	436	0	0	0	0	0	0	0	0	2.98
12	6	518	0	3.47	0	0	0	0	0	0	0
13	6	822	0	0	0	0	0	0	0	0	0
14	10	1,461	0	0	.48	0	0	0	.89	0	1.30
15	8	1,425	0	0	0	.49	0	0	0	.49	.98
16	10	1,945	0	.41	0	.31	0	0	0	.72	.41
17	8	1,820	0	0	1.43	.55	0	0	.82	0	1.10
18	7	1,778	0	0	1.01	1.35	0	0	0	1.52	.39
19	7	2,163	0	.37	0	.28	0	0	.46	1.11	1.20
20	8	2,674	.30	.75	.49	2.80	0	0	3.66	5.46	1.05
21	9	3,309	0	.27	.57	3.35	0	.21	1.87	2.90	1.09
22	7	2,918	0	.27	.96	1.99	0	0	5.14	3.77	2.06
23	9	3,807	0	.24	3.13	6.99	0	2.63	5.23	5.04	1.34
24	6	2,865	.87	0	3.00	4.89	.35	1.22	9.32	7.89	0
25	9	4,295	.42	.61	3.42	7.17	.40	1.00	5.73	6.47	2.19
26	1	586	0	0	1.71	5.97	0	0	20.99	0	0
27	5	2,473	0	1.82	.73	17.75	0	4.57	10.76	7.16	1.21
28	3	1,782	.73	3.98	1.85	12.29	0	3.98	11.34	4.21	0
29	9	5,527	1.09	1.18	1.25	10.73	0	1.90	9.35	7.58	1.81
30	4	2,121	.61	0	.47	5.89	0	2.92	14.57	14.99	1.79
31	6	4,475	1.39	0	2.28	15.64	0	3.31	16.69	5.63	.89
32	5	3,787	1.14	.26	2.48	11.96	0	5.57	12.20	2.69	.98
33	5	3,935	.25	.20	1.17	15.04	0	3.84	17.71	11.26	1.25
34	4	3,349	2.12	1.70	2.18	21.53	0	8.99	12.12	6.60	1.28
35	4	3,809	0	0	5.33	18.11	0	6.14	12.79	5.43	1.00
36	2	1,935	0	1.40	0	11.83	0	6.61	16.07	1.86	.67
37	4	4,256	1.10	2.19	3.27	11.70	0	2.87	21.12	9.45	.42
38	3	3,174	1.89	1.17	2.93	14.62	0	10.84	20.92	3.72	.38
39	1	1,157	0	4.67	10.54	25.15	0	12.79	0	0	1.73
40	2	2,359	3.60	0	.85	36.41	0	8.18	9.20	3.31	0
41	1	1,411	1.28	0	3.05	34.09	0	0	14.10	1.42	0
42	2	1,929	.31	0	2.70	16.54	0	5.60	16.02	4.20	1.03 ^{1/}
43	0	--	--	--	--	--	--	--	--	--	--
44	2	2,703	4.81	2.18	2.55	37.85	0	9.69	11.02	5.07	.48
45	0	--	--	--	--	--	--	--	--	--	--
46	0	--	--	--	--	--	--	--	--	--	--
47	0	--	--	--	--	--	--	--	--	--	--
48	1	980	7.76	4.18	7.24	34.69	0	7.35	8.57	5.82	0
49	1	1,155	11.77	.87	1.99	40.69	1.13	1.56	4.07	4.07	1.21
Total	192	85,688	1.03	.80	2.05	12.32	.05	3.47	9.71	5.03	1.01

^{1/} Includes Construction grade 2 x 4's.^{2/} Includes Standard grade 2 x 4's.^{3/} Includes Utility grade 2 x 4's.

diameter for grade No. 2 white and red fir logs

Lumber grade (continued)									
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage
----- Percent of lumber tally volume ^{5/} -----									
11.36	0	0	88.64	0	0	0	0	0	0
21.19	41.06	19.27	21.85	0	0	1.99	0	1.99	0
34.75	24.01	20.34	10.17	.97	0	0	.85	0	3.67
54.13	16.05	16.51	7.34	.75	1.15	1.84	0	0	0
50.97	14.67	23.55	5.80	0	.58	0	.96	0	0
55.23	22.51	18.13	3.16	0	0	0	0	0	0
56.95	18.89	13.62	2.95	0	.27	1.30	1.16	0	1.44
47.65	16.63	15.72	13.76	.39	0	1.40	.28	0	2.60
64.47	15.12	14.55	3.44	0	0	.57	0	0	0
51.54	15.66	20.99	7.20	0	.71	0	0	0	0
38.81	20.47	22.49	8.27	0	0	.51	0	0	4.78
34.72	18.35	23.95	6.06	0	0	.92	.74	0	11.84
39.12	15.78	21.72	4.23	0	.30	.64	0	0	3.70
45.91	18.77	9.79	5.99	0	.39	0	.57	0	8.31
45.72	18.68	10.62	3.12	0	.55	.55	0	0	6.58
40.27	9.93	13.42	6.04	0	.42	.71	0	0	4.62
35.53	19.62	7.92	5.86	0	0	0	0	0	3.53
27.22	11.95	11.08	9.48	0	1.00	1.12	0	0	10.76
36.35	16.38	11.26	0	0	0	0	0	0	7.34
12.01	8.29	8.73	13.34	0	0	.65	0	0	12.98
18.01	10.04	10.72	2.81	.36	1.18	0	0	0	18.86
16.74	10.86	14.75	9.08	0	0	.29	.58	0	12.83
18.91	10.00	11.23	11.55	.41	0	1.08	.19	0	5.80
18.99	10.34	9.32	4.58	0	.36	.40	.27	.36	9.18
24.85	13.72	10.96	4.81	.29	.42	0	0	.37	7.60
7.01	7.29	6.35	16.64	0	0	.18	.41	0	10.98
5.46	7.67	8.51	10.21	.56	0	.42	0	0	11.20
11.18	8.09	8.59	10.18	0	0	.97	.58	.89	10.42
6.20	12.61	17.31	12.04	0	0	0	0	0	13.39
14.85	7.52	6.98	7.44	.59	.70	.80	.38	0	8.65
11.53	8.64	6.80	5.23	0	.50	.13	.19	0	10.52
18.41	7.70	2.77	6.56	.83	1.38	0	2.77	0	5.53
9.41	4.45	7.59	4.54	0	0	0	0	0	11.87
11.91	10.63	5.67	9.92	0	0	0	0	0	7.94
6.12	6.95	17.16	10.42	0	.57	.83	1.56	.21	8.97
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4.37	.81	4.40	6.99	0	0	0	0	0	9.77
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5.31	.71	6.12	4.08	0	0	0	0	0	8.16
8.74	2.51	4.50	5.54	0	0	0	0	0	11.34
24.30	11.52	11.43	7.65	.14	.29	.44	.27	.08	8.42

^{4/} Includes Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

Table 17.—Lumber grade yields by scaling diameter

Log scaling diameter (inches)	Number of logs	Lumber tally volume	Lumber grade								
			B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
Board feet			Percent of lumber tally volume ^{5/}								
7	6	161	0	0	0	0	0	0	0	0	0
8	55	2,095	0	0	.19	0	0	0	0	0	.38
9	46	2,267	0	0	0	.31	0	0	0	0	1.06
10	53	3,323	0	0	0	.15	0	0	0	0	1.17
11	54	4,139	0	0	0	.12	0	0	0	.46	.43
12	43	4,738	0	0	0	.11	0	0	0	.13	.59
13	35	3,995	0	0	.20	.13	0	0	0	.38	.91
14	30	4,514	0	0	.16	.29	0	0	0	.80	.91
15	33	5,942	0	.08	.20	.13	0	.54	.22	.86	1.27
16	23	4,756	0	0	0	.13	0	0	.25	.90	.29
17	22	5,028	0	0	.66	.08	0	0	.46	1.27	.99
18	14	3,909	0	0	0	1.23	0	.38	.77	1.38	.26
19	17	5,296	0	0	0	.28	0	.40	.57	3.38	1.45
20	15	5,411	0	.31	.24	1.18	0	0	.06	3.03	0
21	9	3,473	0	0	1.15	0	0	0	2.22	2.62	3.34
22	8	3,380	0	.38	0	2.25	0	0	3.17	5.03	.59
23	10	4,281	0	0	.58	2.08	0	0	4.79	4.46	2.29
24	3	1,504	0	0	0	.66	0	1.33	10.11	7.85	.86
25	6	3,107	0	0	.64	1.51	0	.74	12.78	6.57	.19
26	5	2,984	0	0	.67	1.94	0	2.51	7.81	5.73	1.27
27	3	1,909	0	0	1.15	3.30	0	5.13	18.60	3.40	.63
28	4	2,392	0	.84	1.96	7.48	0	4.47	10.16	6.06	1.88
29	4	2,688	0	0	1.97	4.35	0	2.42	18.19	2.64	0
30	1	682	0	3.96	7.77	9.09	0	15.40	15.84	4.40	0
31	2	1,345	0	0	2.45	11.38	0	2.53	13.09	14.87	3.87
32	3	2,180	0	0	.83	3.17	0	2.84	16.74	9.40	2.43
33	0	---	---	---	---	---	---	---	---	---	---
34	2	1,734	0	0	.52	17.88	.98	5.19	13.09	9.46	0
35	0	---	---	---	---	---	---	---	---	---	---
36	0	---	---	---	---	---	---	---	---	---	---
37	0	---	---	---	---	---	---	---	---	---	---
38	0	---	---	---	---	---	---	---	---	---	---
39	1	1,056	0	0	0	4.55	1.80	10.61	21.97	5.02	0
40	0	---	---	---	---	---	---	---	---	---	---
41	0	---	---	---	---	---	---	---	---	---	---
42	0	---	---	---	---	---	---	---	---	---	---
43	1	1,372	0	0	3.13	12.54	0	19.90	7.65	2.48	0
44	0	---	---	---	---	---	---	---	---	---	---
45	0	---	---	---	---	---	---	---	---	---	---
46	1	1,346	0	0	0	7.80	0	13.67	7.95	4.46	3.49
Total	509	91,007	--	.09	.51	1.92	.04	1.45	4.05	2.86	1.01

^{1/} Includes Construction grade 2 x 4's.

^{2/} Includes Standard grade 2 x 4's.

^{3/} Includes Utility grade 2 x 4's.

for grade No. 3 white and red fir logs

Lumber grade (continued)									
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage
----- Percent of lumber tally volume ^{5/} -----									
19.25	35.41	16.15	13.66	0	1.86	13.66	0	0	0
31.98	21.33	27.63	14.70	0	1.53	1.34	.14	0	.76
33.75	19.01	24.57	17.42	.22	.71	1.68	1.28	0	0
43.64	20.28	23.50	8.43	0	.63	2.02	.18	0	0
42.86	22.46	22.20	7.86	.58	.85	1.69	.48	0	0
37.08	25.41	24.51	8.36	0	.51	1.75	.67	.17	.72
53.12	19.50	18.44	5.48	.20	.55	.83	.20	.07	0
45.99	19.93	22.59	5.45	0	1.20	2.13	.51	.04	0
37.84	27.84	20.37	8.11	.13	0	1.09	.12	.18	1.03
46.78	24.52	17.24	6.54	.65	.23	.86	.25	0	1.35
45.15	21.38	20.56	7.14	.22	.48	.90	.24	.22	.26
36.51	28.68	20.90	5.68	0	.66	1.59	.87	0	1.10
32.18	24.64	24.04	6.98	0	0	1.00	.40	0	4.68
39.03	26.41	18.70	7.65	.13	.74	1.33	0	0	1.18
38.32	28.16	16.36	5.52	.46	.20	.92	.12	0	.60
19.20	24.14	25.18	13.20	0	1.42	.47	0	0	4.97
27.23	12.66	21.23	10.42	.19	.70	1.19	.14	0	12.03
14.23	24.34	27.60	7.25	0	1.06	.46	0	0	4.26
26.62	19.83	14.00	3.89	.71	0	.35	0	0	12.17
20.04	15.75	17.02	15.62	.37	0	.54	0	0	10.72
18.39	27.29	11.94	2.52	0	.84	0	.26	0	6.55
21.32	20.49	14.38	2.89	.67	.58	.88	.58	0	5.35
24.89	15.63	13.17	6.51	0	0	1.19	.30	0	8.74
7.77	10.70	15.69	0	0	0	0	0	0	9.38
10.48	11.90	11.08	8.25	.97	1.19	0	0	0	7.96
11.98	10.18	8.53	11.23	.41	0	.92	.28	0	21.06
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16.32	12.34	7.15	6.75	0	0	0	.92	0	9.40
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15.25	5.02	6.25	11.84	0	0	0	0	0	17.71
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20.63	6.78	10.20	7.36	0	0	0	0	0	9.33
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11.22	9.58	6.32	16.49	0	0	0	0	0	19.02
33.27	21.25	19.13	8.07	.21	.50	1.08	.29	.04	4.24

^{4/} Includes Economy grade 2 x 4's.
^{5/} Percentages may not total due to rounding.

Table 18.—Lumber grade yields by scaling

Log scaling diameter	Number of logs	Lumber tally volume	Lumber grade								Shop Out
			B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	
Inches	Board feet	Percent of lumber tally volume ^{5/}									
9	3	122	0	0	0	0	0	0	0	0	0
10	10	817	0	0	0	0	0	0	0	0	0
11	2	109	0	0	0	0	0	0	0	0	3.67
12	9	970	0	0	0	0	0	0	0	0	0
13	8	925	0	0	0	0	0	0	0	0	1.08
14	8	1,070	0	0	0	0	0	0	.84	0	0
15	6	1,003	0	0	0	0	0	0	0	0	1.30
16	22	4,294	0	.19	0	.19	0	0	.42	.28	1.11
17	15	3,116	0	0	.19	0	0	0	0	.96	.48
18	11	2,546	0	0	0	1.49	0	0	2.51	1.69	1.10
19	17	4,424	0	0	.47	.34	0	.29	2.87	5.85	0
20	15	4,145	0	.19	0	.41	0	0	4.13	2.92	1.25
21	12	4,260	0	0	.70	.21	0	.54	1.76	4.77	.66
22	12	4,505	0	0	.91	2.00	0	2.84	11.03	4.79	.95
23	11	4,571	.07	0	.53	2.19	0	.59	7.33	8.44	1.01
24	12	5,617	0	0	.41	.45	0	2.87	11.02	4.74	1.16
25	12	5,568	0	.14	0	1.36	0	1.98	11.01	9.25	.47
26	12	5,811	0	0	.22	.52	.40	2.72	9.12	7.64	.40
27	17	9,163	0	0	.20	1.64	.24	2.02	15.74	8.17	1.01
28	7	4,355	0	0	.55	4.75	.46	3.74	17.82	10.13	1.19
29	17	11,094	0	0	.73	4.64	.36	3.61	17.37	9.00	.20
30	16	11,147	0	0	0	2.92	.22	5.27	17.89	8.22	.59
31	6	4,395	0	0	0	1.87	0	4.14	26.42	6.60	.48
32	9	6,975	.19	0	.99	3.21	.24	4.03	20.93	8.96	.49
33	6	5,258	0	.53	.72	4.94	.78	5.23	16.76	6.45	1.24
34	10	8,468	0	.20	0	2.44	.38	11.16	24.66	7.76	.57
35	9	8,482	.61	.29	.95	4.14	0	10.82	24.15	6.30	1.21
36	7	7,139	0	.42	1.29	8.99	.49	9.06	21.39	3.77	.60
37	6	6,068	0	.21	.87	6.41	.30	12.01	27.09	5.72	.74
38	3	3,443	0	0	2.24	7.78	3.89	13.62	18.88	2.61	0
39	7	7,947	0	0	.86	9.54	.97	14.21	23.49	3.69	.84
40	2	2,366	0	0	.55	2.62	.80	20.96	34.45	1.48	0
41	5	6,583	.26	.96	2.43	5.82	1.18	13.93	22.71	2.22	1.60
42	2	2,615	.31	0	0	2.94	2.18	14.80	32.28	2.45	1.91
43	0	—	—	—	—	—	—	—	—	—	—
44	2	2,833	0	0	1.76	9.64	2.22	17.54	20.51	2.33	.35
45	1	1,678	0	0	0	3.28	0	6.73	14.48	4.59	0
46	1	1,541	0	0	2.14	35.37	1.95	11.75	6.49	6.36	.26
Total	330	165,423	.06	.12	.61	3.74	.44	6.12	16.08	5.76	.74

^{1/} Includes Construction grade 2 x 4's.

^{2/} Includes Standard grade 2 x 4's.

^{3/} Includes Utility grade 2 x 4's.

diameter for grade No. 4 white and red fir logs

Lumber grade (continued)									
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage
----- Percent of lumber tally volume ^{5/} -----									
33.61	4.10	16.39	41.80	0	4.10	0	0	0	0
20.56	20.32	30.35	24.24	0	0	.49	1.10	.37	2.57
11.93	20.18	55.96	8.26	0	0	0	0	0	0
23.09	36.80	22.16	8.35	0	0	1.86	.31	0	7.42
37.19	26.60	22.71	8.11	0	.32	.43	1.30	0	2.27
19.91	30.65	26.17	10.75	0	2.15	2.62	1.03	.47	5.42
15.55	31.11	30.61	13.76	0	0	.80	.50	0	6.38
18.89	28.18	32.60	14.67	0	0	1.82	.54	.19	.93
20.99	33.60	29.69	9.28	0	.26	.38	.16	0	4.01
15.48	19.91	27.62	14.45	0	.63	.31	1.30	0	13.51
21.34	22.92	26.18	15.01	0	.50	.56	0	.16	3.50
19.37	21.69	29.34	13.39	0	0	1.18	.29	0	5.84
20.70	21.29	32.58	11.37	0	.75	.66	.63	0	3.38
17.34	16.07	29.68	9.79	0	.71	1.64	.11	0	2.13
15.69	13.74	21.68	11.25	.24	.92	1.53	.52	0	14.29
14.88	16.35	24.97	5.81	0	1.19	1.00	.96	0	14.21
7.47	16.70	22.56	12.77	0	.77	.34	.61	0	14.57
12.49	18.59	24.95	11.84	0	.43	1.45	1.24	.12	7.88
9.71	14.37	24.06	10.63	0	.59	.64	.27	0	10.71
6.70	17.75	20.11	8.56	0	.55	.62	0	.37	6.68
13.16	13.94	19.46	7.02	.17	.26	.14	.21	0	9.74
10.29	17.40	14.94	9.80	0	.17	.76	.40	0	11.12
9.83	11.92	14.11	10.19	0	.64	1.43	.73	0	11.65
11.61	14.65	17.26	9.29	0	0	1.03	0	0	7.11
5.02	9.49	23.73	9.59	0	0	.42	.38	0	14.72
8.95	13.19	12.47	6.33	.28	0	.33	0	.19	11.09
8.93	8.24	13.65	11.04	.15	.38	.85	1.30	0	6.98
11.15	13.23	10.80	7.41	0	.57	.77	.35	0	9.71
4.55	10.77	14.06	5.37	0	.26	1.71	.13	0	9.79
5.46	16.50	9.82	7.58	0	0	.46	0	0	11.15
8.71	9.01	15.14	4.19	0	0	.20	0	0	9.16
4.86	6.21	12.72	6.42	0	0	0	0	0	8.92
7.55	8.28	12.79	10.25	.24	.17	.90	.46	0	8.26
6.69	11.51	12.31	2.41	0	.31	0	.61	0	9.29
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11.86	7.70	11.96	5.93	0	.56	.85	0	0	6.78
10.19	23.06	20.21	13.05	0	0	.78	0	0	3.64
9.15	7.01	.58	6.23	0	0	0	.45	0	12.26
11.68	15.31	19.39	9.34	.05	.36	.78	.40	.04	8.98

^{4/} Includes Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

Table 19.—Lumber grade yields from white and

Log scaling diameter	Number of logs	Lumber tally volume	Lumber grade								
			B Select	C Select	D Select	Moulding	Factory Select	1 Shop	2 Shop	3 Shop	Shop Out
<i>Inches</i>	<i>Board feet</i>		<i>Percent of lumber tally volume^{5/}</i>								
7	6	161	0	0	0	0	0	0	0	0	0
8	56	2,139	0	0	.19	0	0	0	0	0	.37
9	53	2,540	0	0	0	.28	0	0	0	0	1.10
10	69	4,494	0	0	0	.22	0	0	.38	0	.86
11	64	4,828	0	0	0	.10	0	0	0	.39	.72
12	60	6,381	0	.28	0	.08	0	0	0	.09	.44
13	49	5,742	0	0	.14	.09	0	0	0	.26	.80
14	48	7,045	0	0	.20	.18	0	0	.31	.51	.85
15	50	8,973	0	.06	.13	.17	0	.36	.14	.65	1.27
16	60	11,995	0	.13	.14	.23	0	0	.25	.58	.86
17	48	10,689	0	0	.61	.13	0	0	.36	1.03	.80
18	35	9,001	0	0	.20	1.56	0	.17	1.04	1.38	.50
19	45	13,035	0	.06	.41	.81	0	.26	1.28	3.87	1.10
20	39	12,444	.06	.36	.27	1.25	0	0	2.19	3.46	.64
21	35	12,877	0	.07	.79	1.78	0	.31	1.72	3.56	1.47
22	32	12,782	0	.22	1.02	2.95	0	1.00	6.12	4.10	1.17
23	34	14,433	.10	.45	1.48	3.96	0	1.07	5.38	5.97	1.35
24	25	11,780	.21	.14	1.49	2.45	.08	1.83	9.63	6.18	.72
25	32	15,120	.25	.38	1.63	5.92	.11	1.28	8.68	7.24	.99
26	23	11,911	0	.13	.65	5.51	.19	1.96	8.36	6.87	.68
27	27	14,597	.08	.43	.58	6.17	.15	3.06	14.97	7.10	.97
28	16	9,743	.13	1.45	1.99	8.61	.21	3.81	13.35	7.55	1.10
29	32	20,658	.38	.31	1.24	8.38	.19	2.84	14.51	7.36	.84
30	24	15,651	.13	.26	1.14	6.15	.16	5.44	16.04	8.52	.79
31	17	11,977	.88	.26	1.54	12.71	0	3.36	19.02	7.26	1.78
32	22	16,718	.80	.27	1.76	9.06	.10	4.06	17.01	7.04	.75
33	15	12,097	.13	1.48	1.98	13.30	.34	4.32	15.89	7.18	1.00
34	16	13,551	.52	.55	.61	9.14	.36	9.86	20.08	7.69	.67
35	17	15,738	.66	.90	1.91	15.06	.10	7.98	18.69	6.04	1.15
36	10	10,151	.20	1.18	1.15	11.66	.34	7.63	18.87	3.60	.76
37	13	12,922	.36	1.24	1.93	14.60	.14	7.37	21.94	7.27	.76
38	9	9,749	4.60	1.47	2.85	17.78	1.37	10.12	15.18	3.09	.25
39	12	13,759	.44	1.32	2.02	14.83	.70	11.62	18.67	4.18	.73
40	6	7,225	2.52	1.15	2.42	27.27	.26	10.19	15.47	3.00	0
41	7	9,174	.38	.69	2.21	12.61	.85	10.32	20.61	2.76	1.69
42	4	4,544	.31	0	1.14	8.71	1.25	10.89	25.37	3.19	1.54
43	1	1,372	0	0	3.13	12.54	0	19.90	7.65	2.48	0
44	8	10,589	4.82	3.06	2.63	29.93	.59	9.40	11.06	3.92	1.20
45	1	1,678	0	0	0	3.28	0	6.73	14.48	4.59	0
46	2	2,887	0	0	1.14	22.51	1.04	12.64	7.17	5.47	1.77
47	0	--	--	--	--	--	--	--	--	--	--
48	1	980	7.76	4.18	7.24	34.69	0	7.35	8.57	5.82	0
49	2	2,772	7.25	5.41	1.44	39.07	.47	1.12	8.55	4.33	.72
50	1	1,321	5.00	4.39	2.80	55.03	0	4.62	2.88	6.81	2.42
Total	1,126	398,223	.58	.60	1.22	8.23	.21	3.99	10.70	4.80	.92

^{1/} Includes Construction grade 2 x 4's.^{2/} Includes Standard grade 2 x 4's.^{3/} Includes Utility grade 2 x 4's.

red fir logs by scaling diameter, all logs

Lumber grade (continued)									
No. 1 ^{1/}	No. 2 ^{2/}	No. 3 ^{3/}	No. 4 ^{4/}	1 Common	2 Common	3 Common	4 Common	5 Common	Dunnage
----- Percent of lumber tally volume ^{5/} -----									
19.25	35.41	16.15	13.66	0	1.86	13.66	0	0	0
31.56	20.89	27.07	16.22	0	1.50	1.31	.14	0	.75
32.99	19.60	23.27	18.86	.20	.83	1.61	1.14	.12	0
38.74	20.58	24.50	11.44	0	.47	1.58	.40	.07	.76
42.69	21.87	22.54	8.16	.50	.83	1.78	.41	0	0
36.33	26.08	23.87	8.41	0	.42	1.58	.63	.12	1.66
50.85	21.07	19.09	5.57	.28	.44	.64	.35	.05	.37
44.30	21.35	21.28	5.74	.16	1.15	2.03	.72	.10	1.12
37.91	24.88	20.86	10.26	.09	.07	1.04	.18	.12	1.81
38.28	23.51	23.59	9.54	.26	.12	1.28	.29	.07	.87
39.52	23.89	22.85	8.14	.10	.42	.61	.16	.10	1.29
32.37	23.58	22.37	8.76	.08	.47	.88	.74	0	5.90
29.51	22.65	24.01	9.73	0	.17	.75	.28	.05	5.06
32.16	22.16	23.10	9.43	.06	.38	1.11	.10	0	3.25
36.03	20.91	19.01	8.93	.12	.40	.47	.51	0	3.91
28.41	17.59	23.17	8.07	0	.75	.85	.04	0	4.55
28.80	12.33	17.78	9.05	.13	.61	1.02	.32	0	10.20
24.36	16.66	18.84	5.52	0	.70	.54	.52	0	10.12
19.72	14.32	16.06	9.24	.25	.68	.60	.22	0	12.42
18.37	15.84	19.41	10.54	.09	.21	.97	.70	.06	9.46
11.88	14.35	18.66	9.64	0	.48	.51	.21	0	10.76
14.64	15.78	14.93	5.28	.16	.61	.49	.14	.16	9.61
15.55	12.63	16.81	7.41	.09	.14	.31	.30	0	10.71
10.85	14.75	14.32	9.55	0	.22	.78	.31	0	10.58
12.38	9.95	10.44	7.75	.24	.50	.91	.37	.32	10.36
14.40	12.02	13.11	8.34	.05	.10	.62	.08	.08	10.37
6.66	7.90	14.54	12.27	.13	0	.24	.30	0	12.33
9.03	11.72	10.81	7.34	.18	0	.31	.12	.12	10.90
9.34	7.37	10.84	9.71	.15	.20	.69	.84	.22	8.15
9.61	12.02	12.28	8.80	0	.40	.54	.25	0	10.69
7.54	8.26	9.71	7.64	.19	.36	1.07	.19	0	9.43
7.81	11.60	7.05	5.02	.09	.20	.28	.06	0	11.19
10.34	8.69	11.27	5.16	0	.23	.12	.26	.06	9.36
8.20	4.29	9.06	5.09	.19	.22	.50	0	.11	10.05
8.04	8.04	11.50	10.33	.17	.12	.64	.33	.24	8.46
6.45	9.57	14.37	5.81	.35	.42	.35	1.01	.09	9.15
20.63	6.78	10.20	7.36	0	0	0	0	0	9.33
7.67	3.89	6.61	5.65	.03	.15	.42	0	0	8.99
10.19	23.06	20.20	13.05	0	0	.78	0	0	3.64
10.11	8.21	3.26	11.02	0	0	0	.24	0	15.41
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5.31	.71	6.12	4.08	0	0	0	0	0	8.16
7.86	4.76	6.67	3.00	0	0	0	.86	0	8.48
2.50	2.35	2.73	5.22	0	0	0	0	0	3.26
20.14	14.66	16.21	8.38	.11	.34	.71	.31	.06	7.82

^{4/} Includes Economy grade 2 x 4's.

^{5/} Percentages may not total due to rounding.

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